PRE-FRONTAL LEUCOTOMY

A Survey of 300 cases personally followed over 1½—3 years

MAURICE PARTRIDGE
M.A., D.M., (OXON.), D.P.M., (ENG.),
Assistant Psychiatrist to St. George's Hospital, London;
late of St. Andrew's Hospital, Northampton

BLACKWELL
SCIENTIFIC PUBLICATIONS
OXFORD

This book is copyright. It may not be reproduced by any means in whole or in part without permission. Application with regard to copyright should be addressed to the publishers.

Published simultaneously in the United States of America by Charles C Thomas, Publisher, 301–327 East Lawrence Avenue, Springfield, Illinois.

Published simultaneously in Canada by The Ryerson Press, Queen Street West, Toronto 2.

First printed, May, 1950

Printed in Great Britain for Blackwell Scientific Publications, Ltd.
by A R. Mowbray & Co. Limited, London and Oxford

This book is respectfully dedicated to
the memory of the late

ADOLF MEYER,

formerly Professor of Psychiatry in the
Johns Hopkins University at Baltimore,
by an indolent but affectionate pupil.

'I am not antagonistic to this work, but find it very interesting. I have some of those hesitations about it that are mentioned by other discussants, but I am inclined to think that there are more possibilities in this operation than appear on the surface. I do not think that the relief afforded the patients is so much a shock result as utilization of some things we are learning concerning the frontal lobes and their role in the functioning of the personality. I should hesitate to promise that we could remove distractions and worries by operation. To call attention to what is possible might start an epidemic of hasty human experimentation. After all, any interference with the brain, such as is contemplated in this operation, makes reductions which cannot be repaired. The work should be in the hands of those who are willing and ready to heed the necessary indications for such a responsible step, and to follow up scrupulously the experience with each case. The available facts are sufficient to justify the procedure in the hands of responsible persons, but it is important that the public should not be drawn into any unwarrantable expectations.'

Adolf Meyer, in a discussion following the presentation of six early cases by Freeman and Watts. (*Southern Medical Journal*, 1937, 30, 31.)

PREFACE

In presenting the results of this investigation, which has lasted from 1946 until the present time, I must thank in the first place Dr. Thomas Tennent, Superintendent of St. Andrew's Hospital, Northampton, at whose instigation and under whose aegis it has been carried out. Next, I must thank my friend and colleague, Mr. Wylie McKissock, neuro-surgeon to St. George's Hospital and to the National Hospital, Queen Square, for allowing me access not only to his case-material but to his notes and diagrams, as well as for giving me much stimulating encouragement in various forms.

I must thank also many people, too numerous to name, both in this country and abroad, for having furnished me with information about the cases concerned: but, in particular, for having allowed me to visit the patients in their hospitals as well as for much hospitality and kindness, the superintendents and staffs of: Banstead Hospital, Barnwood House, Bexley Hospital, the Birmingham City Mental Hospital at Winson Green, Camberwell House, Cambridgeshire Mental Hospital, Cane Hill Hospital, Cardiff City Mental Hospital, Cefn Coed Hospital, Fulham Hospital, Great Bramley Hall, Hayes Park, Hereford City and County Mental Hospital, Holloway Sanatorium, Holme Lacy Hospital, the Mid-Wales Counties Mental Hospital, Monmouthshire Mental Hospital, Moorcroft House, the National Hospital for Paralysis and Epilepsy, Netherne Hospital, the Priory at Roehampton, the Roundway Hospital at Devizes, St. Andrew's Hospital, St. Bernard's Hospital, St. Cadoc's Hospital at Caerleon, St. George's Hospital, St. Giles' Hospital at Camberwell, Shenley Hospital, Springfield Hospital, Sutton E.M.S. Hospital, the Three Counties Hospital, University College Hospital, the Warneford Hospital, Winterton Hospital at Sedgefield, Wood End, and the Worcester City and County Mental Hospital at Powick; as well as Dr. Mayer-Gross for initial advice, and Professor Alfred Meyer and Dr. McLardy, of the Maudsley Hospital, for various opportunities of discussion.

I wish that I could impart even half of the pleasure that the investigation has given to me. It has enabled me to learn something of the practice of leucotomy, a little of the science of geography, and much of the art of commercial travel. Apart from its intrinsic interest, it has introduced me to many places that I might not otherwise have seen, and to many friends whom I might not otherwise have known—among them my indulgent ex-employer who will forgive me, I am sure, if when asked 'whom I represented' by fellow commercial travellers, as we compiled our various reports of an evening in country inns, I have sometimes satisfied curiosity by answering, 'A firm called Tennent's.'

MAURICE PARTRIDGE

ST. ANDREW'S HOSPITAL
NORTHAMPTON, 1949

CONTENTS

I wish that I could impart even half of the pleasure that the investigation has given to me. It has enabled me to learn something of the practice of leucotomy, a little of the science of geography, and much of the art of commercial travel. Apart from its intrinsic interest, it has introduced me to many places that I might not otherwise have seen, and to many friends whom I might not otherwise have known—among them my indulgent ex-employer who will forgive me, I am sure, if when asked 'whom I represented' by fellow commercial travellers, as we compiled our various reports of an evening in country inns, I have sometimes satisfied curiosity by answering, 'A firm called Tennent's.'

MAURICE PARTRIDGE

ST. ANDREW'S HOSPITAL
NORTHAMPTON, 1949

PRE-FRONTAL LEUCOTOMY

INTRODUCTION

BIZARRE illnesses may require bizarre treatment, and in psychiatry they often get it. They show so often a stubbornness and resistiveness to treatment, they expose so clearly the ignorance of their pathology and aetiology, that they arouse aggressive reactions in the baffled and frustrated therapist.

So from earliest times there have been psychiatric treatments characterized by an energetic violence. Early British psychiatrists were addicted to a form of treatment known as 'bowssening.' In this, the patient, in ignorance of what awaited him, was induced to stand with his back to a holy well, into which he was precipitated by a shrewd blow, and then repeatedly submerged until in need of resuscitation, which was usually carried out with full religious rites in a neighbouring church. Later, with the decline in mysticism and the development of the high pressure hose, other forms of balneo- and hydro-therapy readily suggested themselves. At one time, as we have recently been reminded by a widely popularized novel and film, patients were cozened into walking along dark and sinuous passages, at the end of which, having descended unexpectedly through an oubliette, they found themselves in a snake-pit. Reginald Scot, an Oxonian practising in the seventeenth century, records a case of a man much grieved by the delusion that his nose had grown so large as to prevent him from passing through the door, so that he spent his life immured; the physician, acting as though the delusion were true in fact, insinuated himself into the room, manoeuvred himself with difficulty past this colossal proboscis, and blindfolded the patient; he then gave the nose a lively tweak with a pair of pincers which he threw into a tub wherein he had taken the precaution to place a quantity of blood and some bullock's liver; the patient, confronted with this apocalypse on removal of the bandages, was startled into recovery. Although '. . . the melancholic humour was so qualified, the man's mind was satisfied, his grief eased,

organize them by disorganizing the neural substrate which subserved their formation. The most logical point of attack seemed to be the frontal lobes, both since they had no clearly assignable function and might therefore withstand damage with impunity, and because they were at that time generally believed to be the seat of the intellectual life. He was stimulated by some work reported at an International Congress held in London in 1935, which showed that extensive ablations of the frontal lobes could be performed on apes with little resultant loss of function. It is tempting to suppose that he felt especially encouraged by a passage read by Jacobsen, describing the effects of bilateral frontal lobectomy on an excitable chimpanzee. This creature, trained to open puzzle boxes which yielded rewards in the form of food, had been accustomed to show such transports of emotion on making mistakes that it was feared some nervous breakdown would ensue. After removal of its frontal lobes, however, the animal—though it made slightly more mistakes than before—displayed a phlegmatic calm. 'It was as though,' said Jacobsen, 'it had joined the happiness cult of the elder Micheaux, and had cast its burdens on the Lord.' That such extensive damage could result in so little ostensible loss of function augured well, Moniz thought, for cautious experiments on the human. He lost little time in initiating the work, which was carried out by his surgical colleagues, first by sclerosing frontal lobe tissue by the injection of absolute alcohol into the brain, and later by cutting out small spheres of white matter with a specially devised instrument called the leucotome.

The results were not at all what was expected. The delusions and hallucinations, which it had been thought would be removed or in some way altered, remained; but, as in Jacobsen's chimpanzees, there was a greater emotional tranquillity. The symptoms were more easily tolerated and caused the patients less distress. A discussion in Paris, followed by publication of the results in a monograph (1936), caused a psychiatric storm. Indeed, at this distance of time, and to those of us who recognize that the essential basis of surgery is the replacement of one lesion by another, the reaction seems to have been excessive.

There was much to be said against the operation. Moniz's data were meagre, the case histories were not beyond reproach,

and his disease cured,' it would seem not unreasonable to suppose that he later relapsed. In our own times, recovery from melancholic states in course of bombing, or as the sequel to having been blown out of bed by a land mine, is not unknown; while doctors, with so many resources of modern science at their command, adopt treatments hardly less extraordinary by which patients are dispatched again and again into states of deep coma by liberal injections of insulin, and are thrown into convulsions by the passage of huge electric currents through their brains.

No less strange than the treatments themselves is the fact that the same word is used for each. They are all 'shock' treatments. Yet it is clear that the 'shock' in each is applied at different levels. In snake-pit therapy and in the technique described by Reginald Scot, the impact of the shock is at the psychic level. In bowssening and in high-pressure hose therapy the shock impinges mainly at the psychic but also at the physical level. In treatments by insulin and electricity, the shock is almost entirely at the physical level, and elaborate precautions are often taken to ensure that the patient experiences minimal, if any, psychic trauma. This use of the same word to denote such widely different procedures implies a trend away from the older Cartesian conceptions of psycho-physical parallelism towards a more modern and seemingly more scientific concept of mind as a function of the body, with a tacit recognition of the fact that mental processes themselves may be altered by making alterations in the physical substrate that underlies them.

It was this concept that led Egas Moniz, Professor of Neurology at the University of Lisbon, to develop what is perhaps the most bizarre treatment of all, in which the brains of the patients are stirred up by a blunt instrument.

It is indeed strange that if, as is now generally believed, mind is a function of the body and especially of the brain, such function can be improved by a treatment which is essentially destructive. But that it can happen is beyond dispute, and will be shown to have happened again and again in the following pages.

Moniz, when speculating in 1933 on the functions of the frontal lobes, conceived that it might be possible to alter a person's thoughts by altering the physical structure by which those thoughts were mediated, and that, in a case where there were fixed and incorrigible delusions, it might be possible to dis-

a bold but blind incision, through trephine holes in the skull, in an upward and downward direction in the plane of the coronal suture, in each of the frontal lobes somewhat anterior to the pre-motor cortex. They had found these incisions to divide the fibres of the thalamo-frontal radiation, which streams forward on either side from the dorsal medial nucleus of the thalamus to the frontal poles. They believed the benefit conferred on the patients by this operation to be associated with the division of these thalamo-frontal fibres, and with the degeneration (which followed as a consequence of that division) of the cells in the dorsal medial nucleus of the thalamus whence the thalamo-frontal radiation arises. They had concluded that the principal effect of operation was a reduction of the emotional components of the psychic life. This they have elsewhere (1944) epigrammatically described as 'bleaching of the affect.' This affective reduction gave the patient freedom from tension and from worry, and somehow came about as a result of the interference with the thalamo-frontal radiation. They described also various personality changes which took place to varying extents. Finally, they had concluded that the net gain afforded by relief of symptoms was such as to offset the intellectual deficits, if any, that might follow operation.

This was a considerable achievement. The results were not only a tribute to the moral courage and perseverance of the authors, but formed a unique contribution to knowledge, as the first attempts at systematization of this bewildering subject.

In the meantime the matter had been taken up extensively elsewhere, and as familiarity with the operation became more widespread, so did the literature increase. It is still, however, generally held that the principal effect of the procedure is to reduce the patient's affective charge, and its use in a wide variety of conditions has been a symptomatic one with that end in view. Thus, it has been used to lessen the turbulence of the florid psychotic, to reduce the tension of the obsessional, to allay the agitation of the melancholic, to diminish the histrionic emotionalism of the hysterical psychopath.

Likewise, a variety of techniques has been developed. Lyerly, in 1941, developed an operation done under direct vision through a speculum. Direct vision has also been used by Scoville (1949) and by McKissock (1949) in a technique by which the pre-

the results were not only inconsistent with expectation, but in a later series (1937) were frankly unimpressive. Further, the crudity of the underlying idea, the apparently irrational nature of the operation, and the inexplicability of the results formed weighty grounds for objection. But most provocative of all, perhaps, was the fact that this crazy excursion into psychiatry was conducted by surgeons at the instigation of a neurologist. It became a trespass, almost an affront. Violent sayings are often applauded, and the objectors raised a vociferous hostility which, if not organized, at least was widespread.

Despite this, a few receptive minds were struck by the possibilities of this idea. Two of these were the American pioneers, Freeman and Watts. A third was the most distinguished psychiatrist of our time, Adolf Meyer, whose verdict on this operation—even now the final one—is quoted at the beginning of this volume. If ever it were possible to place a man in the category of genius on the strength of a single utterance, here is an instance. If to say this would seem extravagant, or to make too much of a small thing, it is necessary only to reflect that here is an opinion passed on seeing six early cases of Freeman and Watts: and that no one, after twelve years of cumulative experience, is now able to say more than this man was able to say, extempore and at once.

Although it is impossible to accept Moniz's original contentions, that his operation was harmless and that no intellectual impairment followed, the results were encouraging enough for pursuit. Freeman and Watts improved them further as they improved the technique. They brought some order to a confused and chaotic subject by the publication, in 1942, of an exuberant and brilliant monograph *Psychosurgery*, which crystallized six years' experience. In this they put forward many speculations which have not stood the test of time, and in spite (or perhaps because) of much remarkable writing it is not easy to form from the book any unifying concepts either as to the effects or as to the underlying *modus operandi* of the procedure. Certain points, however, did emerge. They had devised a standard operation, which they called pre-frontal lobotomy and which we call pre-frontal leucotomy. They had been led by experience to abandon the practice of sclerosing with alcohol, or cutting out spheres of white matter with a leucotome, in favour of making

SCOPE OF THE PRESENT INVESTIGATION

In 1946, it was decided by Dr. Thomas Tennent, of St. Andrew's Hospital, Northampton, that it would be worth while for a series of cases to be investigated before and after pre-frontal leucotomy in a more uniform and personal manner than had hitherto been done. As regards the uniformity it was felt that this might to some extent be achieved in the diagnostic criteria and assessments of progress if all the cases were seen by the one observer: and that the variations inseparable from a blind operation might be reduced to a minimum if all the cases were operated on by the same surgeon who had established his technique. As regards the personal nature of the investigation, it was felt that the one observer should follow the patients up himself, wherever they happened to be, and thus should avoid the pitfalls of relying upon hearsay or of judging from correspondence.

It was further considered desirable that the investigator should have no responsibility either in selection of the cases or in their subsequent treatment, and that he should thus act as an impartial and detached observer.

The present writer accepted an invitation from St. Andrew's Hospital, Northampton, to undertake such an investigation. It was begun in September, 1946.

Every case in the series was operated on by McKissock.

The patients have been seen in more than 30 different hospitals (to the superintendents and staff of which the writer is indebted for many kindnesses), ranging from Surrey to Durham and from Kent to Glamorgan. The institutions themselves have been private nursing homes, neurosis centres, licensed houses, registered hospitals, and county mental hospitals. The case-material has thus been very varied, as have the social backgrounds of the patients.

Owing to the fact, now generally recognized, that the ultimate outcome cannot be assessed in the early post-operative stages, the first post-operative interview was held 6 months after

frontal cortex is undercut. Hofstatter, Smolik, and Busch (1944) have claimed that an operation more conservative than that of Freeman and Watts, involving section only of those fibres connecting the dorsal medial nucleus of the thalamus with the orbital surface of the frontal lobes, is preferable as being adequate in its effect while also less destructive. Others have found otherwise (Freeman and Watts, 1942; McKissock, 1946). Dax and Radley Smith (1946) have tried the effects of several different types of incision, some of which have been reported by Reitman (1946). Peyton, Noran, and Miller (1948) have advocated unilateral lobectomy as being a more controlled, and therefore a less potentially damaging procedure. Pool (1948) has developed a technique called 'topectomy,' in which parts of the pre-frontal cortex are stripped off, leaving intact the thalamo-frontal radiation. A similar possibility had been explored as long ago as 1889 by Burckhardt, who stripped areas of temporal cortex in the hope of abolishing auditory hallucinations. Various excisions of pre-frontal cortex have also been made by Penfield, who refers to the process as 'gyrectomy.' Freeman (1948) now makes an approach through the roof of the orbit, and so enters the pre-frontal area from below upwards. Spiegel and Wycis, on the ground that the results depend on the degeneration of the dorsal medial nucleus of the thalamus, have developed a technique by which a direct attack, called 'thalamotomy,' is made on the thalamus itself. Various unilateral operations, not without effect, have also been reported, and it may be said that there is as yet no certainty as to what is the minimum of damage that is consistent with an adequate result. In fact, the whole matter is in a state of flux. There is no attempt here to present a review of the literature as such, though much has been added since the surveys by Freeman and Watts in 1942, by Walker in 1944, by Brodie and Moore in 1946, and the recent contributions summarized by Freeman in 1947, 1948, and 1949. The interested reader is referred to the bibliography, for this book, although it contains, for the sake of intelligibility, a brief statement on the theoretical possibilities that underlie the operation, is concerned mainly with the factual presentation of the results in 300 cases personally investigated by the writer.

SCOPE OF THE PRESENT INVESTIGATION

In 1946, it was decided by Dr. Thomas Tennent, of St. Andrew's Hospital, Northampton, that it would be worth while for a series of cases to be investigated before and after pre-frontal leucotomy in a more uniform and personal manner than had hitherto been done. As regards the uniformity it was felt that this might to some extent be achieved in the diagnostic criteria and assessments of progress if all the cases were seen by the one observer: and that the variations inseparable from a blind operation might be reduced to a minimum if all the cases were operated on by the same surgeon who had established his technique. As regards the personal nature of the investigation, it was felt that the one observer should follow the patients up himself, wherever they happened to be, and thus should avoid the pitfalls of relying upon hearsay or of judging from correspondence.

It was further considered desirable that the investigator should have no responsibility either in selection of the cases or in their subsequent treatment, and that he should thus act as an impartial and detached observer.

The present writer accepted an invitation from St. Andrew's Hospital, Northampton, to undertake such an investigation. It was begun in September, 1946.

Every case in the series was operated on by McKissock.

The patients have been seen in more than 30 different hospitals (to the superintendents and staff of which the writer is indebted for many kindnesses), ranging from Surrey to Durham and from Kent to Glamorgan. The institutions themselves have been private nursing homes, neurosis centres, licensed houses, registered hospitals, and county mental hospitals. The case-material has thus been very varied, as have the social backgrounds of the patients.

Owing to the fact, now generally recognized, that the ultimate outcome cannot be assessed in the early post-operative stages, the first post-operative interview was held 6 months after

operation, the second after a further 6 months, and the third after a further 12 months, i.e. at 2 years after operation. It is generally held that if the patients have shown no relapse after 18 months, the likelihood of relapse is thereafter small; it is doubtful if there are good grounds for such an assumption.

In those cases living at a great distance, it has not been possible always to adhere to the plan of visits at 6, 12, and 24 months after operation. This will readily be understood when it is explained that the distances involved in travelling have exceeded 60,000 miles. On the other hand, in certain other cases of interest, additional visits have been made, and in any where there has been fluctuation and doubt as to the ultimate outcome, the information has been brought up to date without reference to the fixed schedule for visiting. All cases, therefore, have been personally seen by the writer both before and after operation, regardless of time and distance.

The post-operative interviews took place wherever the patient happened to be, sometimes still in hospital, occasionally in convalescent homes, but more usually living with their relatives. The rendezvous have thus also been very varied, ranging from East-End tenements to the stately homes of England, from *council houses in urban districts to remote farmhouses in the* Forest of Radnor and miners' hostels in Ebbw Vale. Some patients have been followed to the Channel Islands and to France. Two were followed to Johannesburg, and a third to Mombasa.

The conception formed of the case from clinical interview has been implemented in each instance by the hospital notes, by securing the notes—often so illuminating—of all previous admissions to hospital, by discussion with the medical officer and the charge nurse looking after the patient, and by interviewing the responsible relatives: in many cases several of them.[1]

As regards the technique of interview, any set schema for examination has been sedulously avoided. Such schemata, in the writer's opinion, destroy far too much that is of value. On

[1] In certain deteriorated cases (who had been in hospital for many years, remained there after operation, and had fully documented histories which left no doubt as to their previous lives, the diagnosis, onset or course of illness) the relatives were not seen as they had less opportunity than the hospital of observing post-operative changes.

the contrary, it has been held that there are four desiderata for a successful interview:

(1) That the patient and the relatives must be got to talk, and to talk spontaneously.
(2) That time is of no account.
(3) That there must be every informality.
(4) That before leaving the house or hospital there must have emerged a clear picture of the patient's state before the illness, during the illness, and after the operation, with a working knowledge of the mental status not only in the formal sense of orientation, mood, etc., but of how the patient spends his day, of his work and recreation, of his relationships with his surroundings, and of his interests, strivings, and ambitions.

It is clear that, properly to achieve this, minor martyrdoms may be necessary. It has been impossible to avoid talking on all sorts of topics quite devoid of interest to the interviewer: it has been necessary to help with the washing up or the preparation of meals, to do some weeding, play with the children, take them out in the car, bring the washing in out of the rain, etc. Meals have not infrequently been taken with patients, the evening spent with them, sometimes involving a stay over-night or for the week-end, and sometimes they have been entertained. But apart from these, the method is not without its difficulties. It is not easy to conduct a satisfactory interview when the only living room is occupied by the in-laws and children as well as the patient, while the bedrooms are occupied by those asleep before the night-shift. In such cases the necessary people were lured into the garden or were interviewed at length in the car. It is not easy to elicit the sexual history at tea-time in the lounge of Brown's Hotel. When invited by a patient who said that for recognition's sake she would wear a green hat and knot of pink ribbon, to meet her in the lounge of the Regent Palace, the venue was found quite unsuitable for psychiatric interview and it became necessary to hire chairs in St. James's Park, where a reasonably complete examination (including retinoscopy) was possible, except that the number of evening strollers precluded elicitation of the abdominal reflexes. This recognition of patients itself is not always easy, for in 6 months the patient may change surprisingly

in weight, coiffure, demeanour, and facial expression. On one occasion in a district of Swansea, where all the streets looked the same and everyone was called Jones, the writer was misdirected; the lady who opened the door of the house seemed quite unfamiliar, but offered a cordial welcome, saying that she well remembered being visited in the hospital and was delighted at the reunion. Following the first principle, though with some misgiving, of getting the patient to talk spontaneously, there was ten minutes of talk on the rather intimate topic of vulvo-vaginitis before it was possible to persuade the patient that we had never met before.

Experience has shown the value of the informal approach as enabling the observer to see the patient to some extent off his guard. Deceptively good performances can be put up: an indolent, inconsiderate, selfish, shrewish patient may conceal all these characteristics in a three-quarters of an hour interview: to see her in the family situation is likely to be more revealing, and so is information from the relatives. If one were forced to depend on seeing either the relatives or the patient in evaluating the results of the operation, there is no question that the former is the better choice. But even they may be misleading, especially when doting parents or intense family loyalties are involved. Some relatives may say, 'She is wonderful,' when the most cursory glance shows cause for dismay rather than delight; one mother, after a private exordium on her son's 'cure' cried, 'It is miraculous,' as she dramatically threw open the door to reveal a sagging, hunched, dishevelled, unshaven, remote figure who readily proved to be the subject of affective incongruity with multiple delusions and ideas of reference, while much preoccupied with sadistic fantasy.

It is therefore necessary in evaluating the cases for the net to be cast widely; it will be remembered that despite gross personality changes after removal of both frontal lobes, even Brickner's famous case of Mr. A. was quite able to comport himself with decorum when occasion demanded: after leucotomy the degree of personality change can seldom be so gross as was his, and, therefore, it is the more necessary to look far and carefully in order to detect it.

While, therefore, there is nothing in this method that is new,

and practically nothing of the so-called objective results obtained from those psychometric tests that are now so fashionable, so that many may criticize this investigation as being no more than an old-fashioned clinical impression, it is claimed for it that it has been reasonably thorough and dispassionate, and that it produces results immeasurably more reliable than any method of follow-up by letter, by formal interview at out-patients, or of knowledge at second-hand.

OPERATIVE TECHNIQUE

FREEMAN and Watts came to the conclusion, through the results of trial and error, that there was an optimal site for the performance of this operation. This was in the plane of the coronal suture. It can be arrived at by making a trephine hole in the skull on each side, in a plane 3 centimetres behind the lateral margin of the orbit, and at a point 5–6 centimetres above the zygoma. If an instrument be then introduced through these trephine holes on each side successively, and pushed towards the mid-line, it should pass just in front of the tip of the anterior horn of each lateral ventricle. If that part of the instrument outside the skull be then pivoted downwards so that the part inside the skull makes a corresponding excursion upwards, the fibres forming the upper part of the white matter of the centrum ovale in this plane will be to some extent divided; if the instrument is returned to its original position, and that part outside the skull then pivoted upwards so that the part inside the skull makes a corresponding excursion downwards, the fibres of the lower part of the centrum ovale will also be to some extent divided. If this procedure be then repeated through the trephine hole on the opposite side of the skull, there will have been some division of the white matter of the centrum ovale, in both upper and lower quadrants, in both frontal lobes. This is the procedure followed in what we may call the standard operation, in the sense that it is the one still most often used at the time of writing, of pre-frontal leucotomy.

Incisions more than about a centimetre anterior to this plane are thought to be inadequate in their effects on the major psychiatric disorders, though they may be satisfactory in conditions where the symptoms (of tension, emotional disturbance, etc.) are mild. It appears that the more anterior the incision the less profound are the after-effects, and as the operation is liable sometimes to produce undesirable sequelae (as will later be seen) this is a point to be borne in mind (Freeman and Watts, 1943, 1945). On the other hand, incisions more than about half a centimetre posterior to this plane are liable to be fatal, since, if death is not rapid, the

patient is liable to develop an intense lethargy in which he requires every attention, with trophic changes in the form of bedsores and blisters, and a gradual decline to death from obscure causes, which may not take place till several months later but which is usually preceded by a general enfeeblement. McLardy (1948) is inclined to attribute this to an interference, of which the mechanism is little understood, with those autonomic processes which maintain homoeostasis, i.e. which maintain the normal physio-chemical exchanges on which the bodily economy depends.

The instrument used is usually a blunt one in order to minimize the risk of haemorrhage, but many different kinds have found favour. Freeman and Watts used a nasal septum elevator. Willway (1943) used a paper knife. Duff (1946) used a curved bistouri. Crumbie (1943) invented a device with rotating blades. We may, however, agree with McKissock (1943) that the best instrument to use is that which is likely to cause the least accidental damage.

Since the operation is a blind one, the precise extent to which there is division of the fibres forming the centrum ovale at the operative site can only be conjectural in each case. Freeman and Watts (1938) tried to overcome this difficulty by the introduction of opaque dyes, in order to gauge the extent of the incision by subsequent X-ray. There can, however, be no guarantee either that the dye is evenly distributed, or that it has penetrated to the limits of the area involved. Further, the variation in the size, topography, and contents of individual skulls is such as to preclude any high degree of accuracy, however skilled the surgeon, as long as the operation is a blind one.

This would seem an argument in favour of a more open operation. Yet such would be a more formidable procedure for the patient, and would probably carry a higher risk of post-operative epilepsy, while we lack convincing evidence that the results are any better. This accounts for the continued popularity of the standard operation, though the many experiments with alternative techniques also indicate that it is not considered wholly satisfactory.

That there is in fact much variation between what the surgeon does cut and what he hopes to cut has been incontestably shown

by the post-mortem material investigated by Meyer and his associates. Indeed, so great was this variation that there was at first doubt as to whether section of the centrum ovale was a *sine qua non* of successful operation, since the minimum of damage seemed compatible, in certain early cases, with a high degree of recovery (Meyer, 1945). But patient correlation of the clinical findings with the pathological findings (especially on material obtained from cases which had long survived the operation to die later of unrelated causes) does now indicate that the more complete the division of the centrum ovale the more obvious is the operative result (Meyer, 1947, 1948, 1949). This is not necessarily to say, however, that the more complete the division of the fibres the more satisfactory is the outcome, for the greater the damage the more are undesirable sequelae likely to appear, in addition to the beneficial ones. Further study will show, in all probability, that it will be possible to secure an adequate effect with a restricted operation in suitably selected cases. At present, however, the object of the standard operation is to sever the fibres of the centrum ovale in the plane of the coronal suture to a maximal extent, while causing as little damage as possible to the cortex of the hemispheres.

The variation in the extent of the incision made is presumably one of the factors that accounts for the variability in the results. Other factors will be the amount of haemorrhage, of meningeal reaction, and of accidental damage; the variation in these, and the fact that they may occur to varying extents on one or other side or both, may account for many unexpected post-operative changes. We must also bear in mind that brain tissue may show a certain elasticity, so that the fibres may bend before the pressure of the instrument and return thereafter to their former position without any more than a partial degree of section, despite quite wide excursion of the instrument employed. This has lately been shown by Beck and Meyer (1950).

Pathological investigations have also confirmed the view of Freeman and Watts that the great bulk of the fibres cut belong to the thalamo-frontal radiation. But Meyer has shown that fronto-thalamic connections are also divided, and that these, though smaller, are not inconsiderable, while there are also involved direct connections between the frontal poles and

the hypothalamus, and efferent fibres from the frontal poles running to the uncus. We may conclude, however, that by dividing the centrum ovale by the standard procedure, the main structural alteration achieved is undoubtedly the division of the thalamo-frontal radiation.

As all the cases which we are about to consider were operated on by McKissock, it is pertinent here to include the surgeon's own description of his technique as practised in the cases under discussion.

> 'I have in general taken a point 3 centimetres behind the lateral margin of the orbit and 5–6 centimetres above the zygoma as the centre of my 2–3 centimetre skin incision. The incision is made down to bone, and a self-retaining retractor inserted firmly to give a wide exposure and a bloodless field. A 1 centimetre burr hole is then cut in the line of coronal suture and a cruciform incision made in the dura.'

McKissock prefers to use 'the least damaging instrument of all,' a brain needle. This is then

> 'introduced in such a direction as to pass close in front of the anterior horn of the ventricle to a depth sufficient to be just clear of the grey matter of the inner aspect of the frontal lobe. The stylet is withdrawn and the needle made to pivot about the point of entrance through the dura so that the blunt inner extremity travels upwards towards the superior surface of the frontal lobe. As the point is made to travel upwards the needle is pushed more deeply into the brain so that the line of the section runs parallel with the falx and does not, as it otherwise would, become steadily more distant from it. When the needle has reached sufficiently close to the upper surface of the hemisphere it is withdrawn and reintroduced along the original line in order to deal with those fibres running from the lower part of the frontal pole; on this occasion the point of the needle is made to travel downwards, again parallel with the falx, and is then brought laterally across the anterior fossa roughly in the same vertical plane as the lesser wing of the sphenoid, until it reaches a point just short of the lateral aspect of the skull. During this part of the section the needle is progressively withdrawn for fear of damaging the grey matter of the orbital surface of the frontal pole.
>
> 'A wet patty is then left in the opening in the bone whilst the performance is repeated on the opposite frontal lobe. The first

incision made is then closed in three layers with fine, unabsorbable, black silk sutures, after which the second is similarly treated and a head-dress finally applied.'

McKissock (1947) devised a method for gauging his own accuracy. By taking random cases in a long series, and by taking serial X-ray photographs as the brain needle was moved through its upward and downward excursions on each side at operation, and then by making tracings from those photographs, it was possible to plot in each case the route over which the needle had travelled in relation to the contour of the skull into which it had been introduced. Comparison of the results obtained in this way showed a creditable uniformity.

Yet, at post-mortem that has not always been borne out; and when one considers that McKissock has performed over 1,300 of these operations—a stupendous total—and probably has more experience in this field than anyone else in the world, one is obliged to recognize the difficulty with which the pursuit of accuracy confronts the neuro-surgeon.

The variation of the contents of individual skulls is also brought out by McKissock's notes, made immediately after the operations, and kindly loaned to the writer, on the cases in the series about to be considered. Out of the 300 cases, there were 7 of whom it was recorded that, for clinical reasons, the incision was made deliberately further back than usual, i.e. a matter of a few millimetres. In 2 of these 7 cases the ventricle was entered on both the up and down stroke on each side. In 2 more the ventricle was entered on the left side only. In the remaining 3 neither ventricle was entered at all.

Of the other 293 cases,

(1) the ventricle was entered on both up and down strokes on both sides in 8,
(2) the left ventricle was entered on both up and down strokes and the right ventricle only on the down stroke in 1,
(3) both ventricles were entered, but only on the down stroke in 1,
(4) the left ventricle only was entered on both up and down strokes in 11,
(5) the right ventricle only was entered on both up and down strokes in 2,

(6) the left ventricle was entered on the up stroke only in 8,
(7) the right ventricle was entered on the up stroke only in 2,
(8) the left ventricle was entered on the down stroke only in 4,
(9) the right ventricle was entered on the down stroke only in 10,
(10) in one case the right ventricle was entered only on the down stroke, and the left ventricle only on the up stroke,
(11) in 2 cases the needle was introduced into the left ventricle, was withdrawn and re-inserted,
(12) in 2 cases the needle was introduced into the right ventricle, was withdrawn and re-inserted.

That is to say that in 57 out of the 300 cases, or 19%, something unexpected with regard to the posterior landmarks was encountered at operation.

Abnormal depth of the sub-arachnoid space was also noted in 12 other cases.

When we add to these the unpredictable effects of such accidents as haemorrhage, oedema, and scarring, it is clear that however great the skill of the surgeon, there must inevitably be unpredictable variations in the post-operative results.

None the less, although 2 cases in this series have had only unilateral operations, and although 3 cases have had the complete operation performed on two separate occasions each, it has not been found possible, even on prolonged consideration, to find any satisfactory correlation between the variations in the operative procedure as recorded by McKissock and the clinical results as observed by myself. For this reason, therefore, the cases will be taken as a whole, and although appropriate reference will be made where there has been any such major departure from the ordinary procedure, the net effect of our considerations will be to treat them as though all the cases had been operated on alike. In many cases, in our present state of knowledge, it is still beyond the wit of the clinician to know how much of the post-operative state is due to residua of the illness, how much to the operation itself, and how much to accidents of nature, whether in the form of anatomical variation or of side effects that are as yet beyond our control.

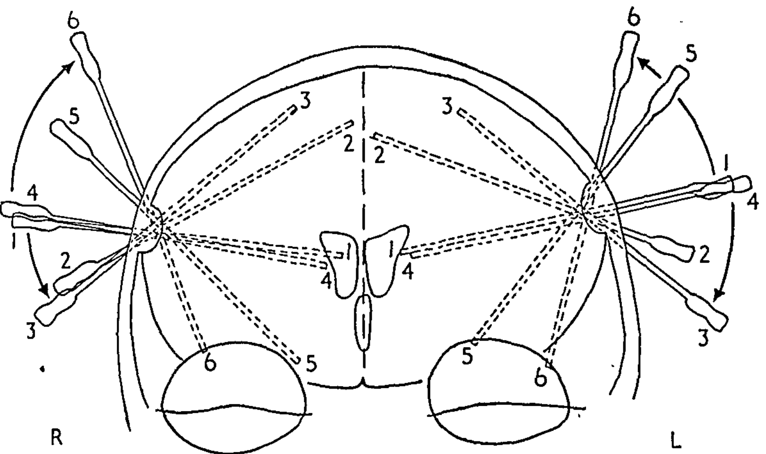
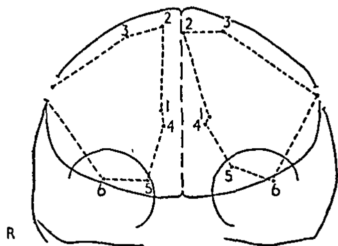
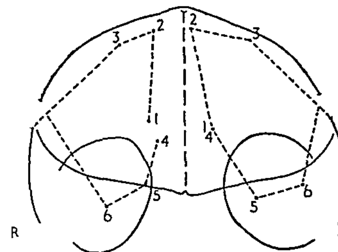
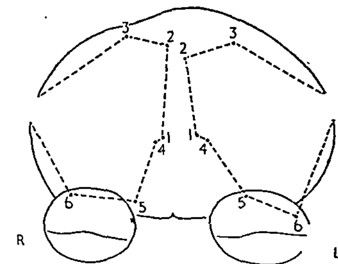


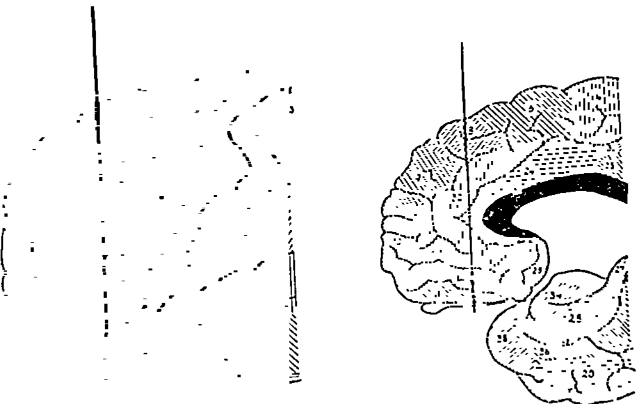
Fig. 1. McKissock's diagram to show the intended excursion of the instrument in the operation of pre-frontal leucotomy.







Figs. 2, 3, and 4 show the excursion that was made by the instrument in three actual cases. The drawings were traced from X-ray photographs taken during the operation in each instance, to show the position reached by the instrument after each successive movement. The cases were photographed with no other object than to test the uniformity of the procedure, and were Numbers 446, 453, and 552 in McKissock's series (See page 16.)



FIGS. 5 and 6 show the plane of section aimed at in the standard operation as viewed from the lateral and medial aspects of the frontal lobes. (With acknowledgements to Professor Alfred Meyer.)

COMPLICATIONS AND SEQUELAE

THE Board of Control, in reporting on the results of 1,000 cases, gave a death rate of 3%. The other substantial compilation of figures, that of Ziegler (1943), gave a death rate of 1·9%. If we mass together the case-material, as recorded in the literature, of Fleming (1944), Hutton (1943), Rees (1943), Dax (1943), Moore (1946), Ström-Olsen (1946), Cook (1946), Frank (1946), Hofstatter (1945), and Duff (1946), we find that there were 27 deaths in exactly 900 cases: a mortality of 3%.

In this present series of cases operated on by McKissock there is a little difficulty in assessment. There were in all 23 deaths, and it has been felt proper to divide them into five groups:

(1) Those to which the operation did not in any way contribute.
(2) Those directly due to the operation itself.
(3) Those to which the post-leucotomy state contributed.
(4) Those dying some time later of obscure causes to which the operation may have contributed by indirect autonomic effects.
(5) Those due to the patient having had an operation, but not specifically due to that operation having been pre-frontal leucotomy.

With regard to group (1) we need not concern ourselves beyond saying that 4 patients died many months after operation of unrelated causes. One was accidentally drowned; one died of a second stroke, the first of which had been a contributory cause to the depressive condition which had brought her to operation; one died five months after operation from heart failure with (pre-operatively) auricular fibrillation; one died more than a year after operation from pneumonia.

With regard to group (2) there were 10 deaths which may be considered to have been directly due to operation. Five cases died rapidly from cerebral haemorrhage. A sixth, who died within 48 hours of operation, was considered to have died from bronchial pneumonia: but post-mortem examination revealed cerebral haemorrhage which was considered in itself an amply

sufficient cause of death (Meyer, 1947a). The seventh case showed signs of recovery, then became comatose and died within a week of operation. She had had a skull of egg-shell thinness, as a result of which she had sustained unexpected trauma to the brain at operation. The eighth fell into a coma six weeks after operation (and after return home) in which she rapidly died. No autopsy was done, but little doubt can be felt that the operation had been responsible. The ninth died in a coma which suddenly supervened 12 hours after an epileptic fit, the last of a series which had appeared only since operation. The post-mortem report showed that the antero-mesial aspect of the temporal lobe had been involved at operation, with the production of a 'cystic space under the pia arachnoid; at this point the underlying brain is shrivelled and atrophied, the replacing cyst having a diameter of approximately that of a shilling. No thickening of the corresponding dura mater was seen which would be consistent with an absorbed subdural haematoma . . .' (McMenemey, 1947). There was no other peculiar finding, but it had been noted at operation that the arachnoid membrane was unusually thick and white. Notwithstanding uncertainty as to the actual cause of death, no doubt can be felt that the operation here played its part. The tenth patient was found dead in bed one morning during the 25th post-operative month. At the inquest the cause of death was found to be asphyxia following an epileptic fit. She was aged 49, and her first and only other fit had occurred in the 23rd post-operative month. These cases are therefore included to make 10 deaths directly due to the operation.

In group (3) there were 2 cases to whose death the post-leucotomy state may have contributed. One man died more than a week after operation, while up and about, of a pulmonary *embolus arising from thrombosed haemorrhoidal veins.* The peculiar post-operative inertia that is liable to follow pre-frontal leucotomy may have contributed to the development of this unsuspected thrombosis. The other case was that of a woman who died of bronchial pneumonia seven months after operation, by which she had been rendered unrestrainedly noisy. This had led to her receiving large amounts of sedation which, coupled with a marked post-operative physical deterioration, in all probability contributed to the fatal outcome.

In group (4) there were 4 cases, all middle-aged, who died of obscure causes at 3, 10, 13, and 21 months after operation respectively. No satisfactory cause for death was found at autopsy in any of them. The first was a manic patient whose mania was somewhat subdued but continued after operation in attenuated form: he showed an insidiously progressive physical enfeeblement, as though his vitality were slowly but visibly being used up. The second was a manic-depressive patient, who remained free from manic and depressive symptoms but who showed a reduced animation which became rapidly more marked a few weeks before death, which took place during a coma. The third was a deteriorated schizophrenic with some affective admixture, as also was the fourth. Both these patients showed post-operative reduction of activity which became gradually more noticeable until, in about the tenth month in one and about the eighteenth month in the other, they were unmistakably enfeebled and steadily declined until they died some 3 months later. It is thought probable that these 4 cases are instances of the failure of those autonomic processes which maintain the normal physio-chemical exchanges of the body, and thus control its economy and homeostasis. This is believed by McLardy (1948) to be the explanation of post-operative deaths of this sort where no obvious cause is to be found, although a general physical deterioration may be evident. He believes the autonomic failure to be due to interference, either through the operation or through accidental damage, with the rostral connections of the striatum and of autonomic centres in the hypothalamus.

In group (5) there were 3 cases. Two, with auricular fibrillation, died within 24 hours and 10 days respectively of operation. In neither was there any indication that the surgical intervention itself had played any part. One might be considered an 'anaesthetic death'; it was felt that the fatal outcome in the other might just as well have happened in the absence of operation, or following any other kind of operation. The third case was an agitated depressive desperately ill and quite unmanageable with a B. coli septicaemia. The prognosis for recovery from this combination of conditions in the absence of operation was considered hopeless. Leucotomy seemed to have a tranquillizing effect; in fact, the patient died some days later.

The reader may form his own assessment. We must exclude the 4 patients in group (1), but if the other 19 are all included, the mortality is 6·3%. If we exclude the 3 patients in group (5) with serious pre-existent organic disease, we are left with 16 cases, a mortality of 5·3%. If we exclude the 4 cases in group (4) who died between 3 and 21 months after operation of obscure causes, we are left with 12 deaths, or a mortality of 4%. If we exclude the 2 cases in group (2), the operative contribution to whose death is very much a matter of opinion, we are left with 10 deaths, a mortality of 3·3% which corresponds very well with other assessments in the literature. But of those cases dying of cerebral haemorrhage, it may be noted that one had a blood pressure of 190–215/120, and another a blood pressure of 210/120.

The writer's opinion is that 12 of the deaths can be considered certainly due to operation: these are the 10 cases in group (2) and the second case in group (3) together with the first case in group (4). Both these last 2 cases showed obvious enfeeblement from the time of operation onwards. This gives a mortality of 4%. If the markedly hyperpietic cases be excluded, we might conclude that the operative risk in a fit person is just under the 3% found by other investigators. We must bear in mind, however, that the later and more obscure deaths may also be attributable. Thus, the mortality in fit patients appears to be under 3%: the deaths certainly due to operation, including the hyperpietic cases, amount to 4%: the deaths probably due to operation, including all those dying later of obscure causes, amount to 16, or 5·3%. It is only if we include the 2 cases with auricular fibrillation, the case with B. coli septicaemia (all three poor operative risks), and the man who happened to develop a pulmonary embolus from thrombosed haemorrhoidal veins 10 days after operation, that the mortality rises to 6·3%.

That in this assessment we are erring on the side of pessimism is shown by the fact that in McKissock's first 500 cases, from which poor operative risks were excluded, the mortality was 1·8%. This was before the present investigation started. It was when this mortality was established that he became willing to accept for operation operative risks of all kinds, provided that the prognosis was hopeless in absence of such treatment.

The facts that (1) 5 out of the 6 patients dying from cerebral

haemorrhage at operation were men, although (2) in the whole series there were half as many women again as there were men, and (3) that 2 of the hyperpietic men died at operation, whereas all of the hyperpietic women survived, suggests that hyperpietic women may tolerate this procedure better than hyperpietic men.

If death be a complication of this operation (and the Board of Control considered it discreetly under the heading of 'social effects'), we have dealt with the most serious one.

Such alarming complications as hemiplegia, described among the early American cases and occasionally since, are now very rare indeed. In this series there were none.

The next consideration is epilepsy. The incidence of epilepsy after pre-frontal leucotomy is usually stated as about 3%. There are various factors which militate against accurate assessment. For example, everyone with experience of mental hospital practice knows that psychotic patients are liable to vary the monotony of their lives by the occasional production of an epileptic fit, quite independently of a cranial operation. Thorpe (1946), when describing post-operative epilepsy in a post-encephalitic man, found on scrutiny of the case records that epilepsy had in fact been observed 10 years before, though this had previously escaped his knowledge. Similarly, a woman approaching middle age who had been examined by the writer in anticipation of a pre-frontal leucotomy which in fact was never done, had her first and only epileptic fit on the day before the operation was planned. Ignorance of such events may be misleading. And in the present series of 300 patients there were no fewer than 12 who were found to have a pre-operative history of occasional epileptic fits, in some instances more than 20 years before operation. On the other hand, the error is likely to be in the other direction, and it is probable that mass compilations of figures err on the side of optimism, not only because epilepsy may have made its appearance after the figures had been compiled, but because it may have occurred unreported after the patients had been discharged from hospital. In the series at present under consideration, there were 4 patients who had epileptic fits both before and after operation. There was nothing to show that there was any post-operative alteration in either the frequency or the severity of the attacks. There were a further 8 patients with a history of having had

epileptic fits before operation, though sporadically, who have shown none in 2–3 years since. In addition, there were 2 patients with unstable electro-encephalographic records before operation who have shown no evidence of epilepsy since, though one of them is subject to transient and episodic rages of peculiar violence which were not in evidence before. Quite apart from the foregoing cases, however, there were no fewer than 30 patients out of the total of 300 who, after operation, showed epileptic fits for the first time. This is 10%, which is more than three times as high as the generally accepted figure, and suggests that post-operative epilepsy occurs a good deal more often than may be supposed. It is true that some, but by no means all, of these patients had single fits. The incidence is set out in increasing order of severity.

Single fits: 7 patients—on 1st, 9th, 16th, 18th post-operative days, and in 10th, 11th, and 16th post-operative months respectively.

Two fits, each on same day: 2 patients—in 5th and 12th post-operative months respectively.

Two fits, with interval between: 5 patients—in 6th and 7th post-operative weeks; in 13th and 15th post-operative months; in 16th and 18th post-operative months; in 22nd and 36th post-operative months; in 23rd and 25th post-operative months.

Three fits, all on same day: 1 patient—in 19th post-operative month.

Three fits at intervals: 3 patients—between 21st and 24th post-operative months (one attack only was witnessed, the others inferred from otherwise inexplicable nocturnal faecal incontinence); between 12th and 15th post-operative months; on 1st post-operative day, in 10th post-operative month, and in 4th month after a second operation.

Three minor fits and one major: 1 patient—in 8th post-operative month.

Five fits each: 2 patients—at irregular intervals over 2 years in one, irregularly between 13th and 24th months in the other.

Six fits: 1 patient—3 in succession in the 10th month and 3 more in succession in the 15th month after a second operation.

Seven fits: 1 patient—in 1st, 2nd, 3rd, 7th, 11th, 14th, and 19th months.

Numerous fits: 3 patients—2 had 1–3 fits a month, the third had fits at about monthly intervals but with gradually increasing periods of freedom.

Status epilepticus: 4 patients—one died after a fit as already described; one had 1 bout with 2 years freedom since; 2 had 2 bouts, in the 7th and 13th months, and in the 11th and 24th months respectively.

It should be pointed out, however, that the fits of 5 of these patients bore a suspicious relation to convulsant treatment, the epileptogenic possibilities of which have been suggested by Hobson (1936) and by Liebert (1942), though it is also true that many patients received post-operative convulsant treatment without developing epilepsy. Thus, of these 5 cases, one patient had 2 fits, both in the second post-operative month and during a course of electrical treatment: one patient had 3 fits in the same day, during a course of electrical treatment in the nineteenth post-operative month: another patient had 2 fits in succession in the sixth post-operative month (during a course of electroplexy) followed by others scattered over 18 months: another patient had a single fit while having daily electrical treatment in the twenty-third post-operative month, followed by a second, and fatal, fit in the absence of electrical treatment 2 months later: and there was the patient who, having had very numerous fits, some occurring in bouts, together with what were probably epileptic equivalents, finally died after a single fit. In these last cases the earlier attacks may well have been precipitated by electroplexy, as judged by their time relations. The behaviour of all these patients, who were excitable schizophrenics, showed deterioration in relation to the epilepsy.

Twenty-two of the 30 patients who developed post-operative epilepsy were in the schizophrenic group. As only 158 out of the 300 cases came within the schizophrenic group this would suggest that schizophrenic cases have a special liability to post-operative epilepsy. A further point that emerged, and which is discussed in the results of the particular groups concerned, is that the incidence of post-operative epilepsy is markedly higher in schizophrenic men than in schizophrenic women (see pages 199 and 200).

As regards control of the post-operative epilepsy by medication, the 2 patients who died in relation to fits had had no treatment by drugs. Of the 3 cases who had numerous fits, 2 had no medication at all, and in the third the fits were reduced by treatment to one in about 3 months instead of from 1 to 3 in each

month. The patient who had 7 fits had been given medication after the first, so that the second to the sixth occurred in spite of it, though the seventh made its appearance within 5 days of medication having been temporarily stopped. Of the 2 patients who had 3 fits each, the epilepsy appeared to be entirely controlled by treatment in one case, but not in the other. Again, of the 4 patients who had 2 fits each, 2 had the second fit despite medication, while the other 2 continued free from fits in the absence of medical treatment.

The figures are, therefore, inconclusive, but it would seem that the disability rate from post-operative epilepsy may be increased by electroplexy but reduced, as would be expected, by sedation, if the latter were more generally given than appears to be the case. On the other hand, the possibility that an uncertain number of other patients may develop epilepsy as the years go on has to be reckoned with.

We have now dealt with death and with epilepsy. Perhaps the next most troublesome complication, at the physical level, is incontinence.

Rectal incontinence occurred in quite a number of cases for the first 24–48 hours after operation, but except in deteriorated schizophrenics who had also shown it pre-operatively, it persisted in only 4 cases. One of those was a deteriorated schizophrenic already, who had been free from faecal incontinence before operation, but showed it occasionally thereafter; the second was a schizophrenic patient who improved for some 6 months after operation, but then showed a progressive deterioration of which faecal incontinence became an accompaniment some 12 months later. The third was an obsessional patient (CASE 108, see page 368) the psycho-dynamics of whose condition were never explained, but who was later found to have concealed, before operation, some underwear which had been faecally contaminated; in her the incontinence was almost controlled within a fortnight, and entirely so within a month. The fourth was a manic-depressive patient who became slightly hypomanic after having been operated on in a depression, and who remained rectally incontinent for a fortnight, over which, as with other things, she showed an insouciant equability. It is doubtful whether the operation played any part in this develop-

ment in the first of these 4 cases; it almost certainly played no part in the second; in the third and fourth cases the symptom persisted for so short a time that we can afford to dismiss the matter as being of no consequence.

Urinary incontinence, however, is another matter. It is a common failing in schizophrenic patients, and where it occurs in such it is not necessarily always easy to tell whether it has occurred because or in spite of the operation. In order to assess its true frequency, therefore, and that of changes, subsequently to be discussed, at the physiological level, the schizophrenic and other deteriorated cases in this series have been excluded from these considerations.

While urinary incontinence is common for a few days after operation in all types of cases, it was found to persist for longer than that time in only 11% of undeteriorated cases. By 6 months after operation 9% of cases were found still to be suffering from occasional dribbling, but this was a serious social embarrassment to only 2½%. By 12 months after operation only 4·6% of patients still showed this tendency to dribble, and this was further reduced to 3·2% by 2 years after operation, while it was an embarrassment to only 3 patients in all.

Urgency and frequency, on the other hand, were very much more common. It must be emphasized in this connection that the patient after leucotomy does not, on the whole, tend to complain about somatic symptoms, and it was very striking how many patients replied with a simple negative when asked if they had any trouble with the water: but if the question were amplified with specific inquiry as to frequency and urgency, affirmative answers were quite frequently obtained. Thus 38% of cases were suffering from frequency at 6 months after operation, and no less than 66% complained of urgency when asked. At 12 months the number was reduced to 24·5% who complained of frequency and 28% who complained of urgency, while at 24 months after operation only 9·3% complained of frequency and 15% of urgency. This was only a serious social embarrassment, however, to the same patients who still complained of dribbling. There was no significant difference between the two sexes as regards development of frequency, but urgency was nearly twice as common in women as in men.

There were no physical signs of interest or importance.

We come now to what we may call changes in the patient at the physiological level. The most striking of these were the gains in appetite, weight, and sleep. These are all well recognized sequelae of operation, though it is remarkable how seldom there are references in the literature to the alterations in the patients' sleep.

About 80% of patients in this series showed an increase of appetite after operation, sometimes to an embarrassing extent. Stealing of other patients' food and raiding the ward kitchen were not uncommonly observed among the deteriorated psychotic patients. The socially preserved patients showed this tendency more obviously at home, where they could more readily relax to be themselves, than in hospital. Raiding of the larder was frequent: many families were obliged to have someone on watch to prevent interception by the patient of the approaching delivery boy: finishing other people's remnants, wolfing the whole sweet ration and expecting a share from the others' as well, and the repeated enjoyment of snacks between meals, were all not uncommonly observed. One woman, asked to help with the teas at a church bazaar, ate the sandwiches as fast as the others cut them, and was piqued at her subsequent relegation to the white elephant stall. The most remarkable case, which is not to be taken in any way as typical (especially since it occurred in a schizophrenic patient) is here quoted as a pathological curiosity.

Case 206 (page 237). A girl of 23 returned from a prolonged stay in hospital and, since her father had re-married in her absence, met her stepmother for the first time. She arrived at breakfast and celebrated the introduction by eating twelve rounds of buttered toast, in addition to cereal and a main course. When it came to lunch-time the stepmother was disconcerted to find that her new acquisition had spent part of the morning in eating every available item of food in the larder. In the afternoon, an uncle called and gave the patient £1 as a token of welcome on her homecoming; when she returned from a stroll, it was found that she had spent the whole of this on food. When seen a year after the operation she no longer raided the larder, had become justly concerned by her increase in weight, and had importuned her local doctor for thyreoid tablets. The treatment was not successful, for even while taking these she indulged her appetite. Indeed, a few days before she was seen, she had felt hungry

at midday, and to fortify herself against a visit to the Labour Exchange, had had a plate of fish and chips, a plate of bread and butter, a plate of cakes and some buns. On emerging from the Labour Exchange at one o'clock, she had assuaged her appetite with a light [illegible] me stewed [illegible] She spent nearly all her money on such unrationed foods as she could buy, especially nuts and cakes, while she specially favoured some comestibles known as 'nippets' and 'zubes.' 'It wasn't so bad,' said her father, 'when we gave her pocket money, but it was a worry when she came to earn two pounds five a week.'

In about one-third of the cases who showed it, the increase of appetite was considered to be only one aspect of a generally increased capacity for enjoyment; but in the others it seemed more than that. In about one-half of the latter, the appetite had fallen to about pre-operative normal within a year, and in only one-tenth of the cases was there evidence of pathological appetite by 2 years after operation.

Approximately 90% of the patients gained in weight, from a few pounds to several stones. The largest gain in weight found, over a period of 2½ years, was 100 lb. A number of patients gained between 50–60 lb. and gains of 20 lb. were not uncommon. It should be stressed that many of these gains occurred in absence of excessive eating, and it is certainly not felt that appetite was their main determinant. Two-thirds of the patients became approximately steady in weight between 6 months and a year, or, as if some physiological mechanism were able to re-establish itself, began to stop at, or decrease to, their approximate normal weight. About one-third remained overweight. A few continued to gain even 2 years after operation. All except one of those were women.

Sleep, which was pre-operatively disturbed in the great majority of cases, was restored to within normal limits in 90% of the patients. Three out of the 300 complained, however, of sleeping more lightly than before, though the great majority found the opposite. A large number of patients observed that post-operatively they slept—as one of them phrased it—'dead,' and several remarked that their sleep had become unusually dreamless. This latter tendency, however, disappeared, as did the

There were no physical signs of interest or importance.

We come now to what we may call changes in the patient at the physiological level. The most striking of these were the gains in appetite, weight, and sleep. These are all well recognized sequelae of operation, though it is remarkable how seldom there are references in the literature to the alterations in the patients' sleep.

About 80% of patients in this series showed an increase of appetite after operation, sometimes to an embarrassing extent. Stealing of other patients' food and raiding the ward kitchen were not uncommonly observed among the deteriorated psychotic patients. The socially preserved patients showed this tendency more obviously at home, where they could more readily relax to be themselves, than in hospital. Raiding of the larder was frequent: many families were obliged to have someone on watch to prevent interception [illegible] boy: finishing other pe[illegible] ration and expecting a share from the others' as well, and the repeated enjoyment of snacks between meals, were all not uncommonly observed. One woman, asked to help with the teas at a church bazaar, ate the sandwiches as fast as the others cut them, and was piqued at her subsequent relegation to the white elephant stall. The most remarkable case, which is not to be taken in any way as typical (especially since it occurred in a schizophrenic patient) is here quoted as a pathological curiosity.

CASE 206 (page 237). A girl of 23 returned from a prolonged stay in hospital and, since her father had re-married in her absence, met her stepmother for the first time. She arrived at breakfast and celebrated the introduction by eating twelve rounds of buttered toast, in addition to cereal and a main course. When it came to lunch-time the stepmother was disconcerted to find that her new acquisition had spent part of the morning in eating every available item of food in the larder. In the afternoon, an uncle called and gave the patient £1 as a token of welcome on her homecoming; when she returned from a stroll, it was found that she had spent the whole of this on food. When seen a year after the operation she no longer raided the larder, had become justly concerned by her increase in weight, and had importuned her local doctor for thyroid tablets. The treatment was not successful, for even while taking these she indulged her appetite. Indeed, a few days before she was seen, she had felt hungry

diabetes insipidus following this operation (of which, despite the occurrence of frequency of micturition, there was no evidence in this series), described the appearance of trophic changes, which had also been remarked upon by Knight (1943). In this series, 2 patients, both women and one of them with post-operative epilepsy, complained of oedema, in each case in the left leg below the knee, occurring in one case in the seventh and in the other in the fourteenth post-operative month. No local or other cause was found in either case, and in each the condition cleared within a fortnight. Whether this can have any connection with the operation is not known. Another trophic change which, however, would seem inevitably connected with the operation, but which is the reverse of what might have been expected, is the following:

> A woman of 48 had never been able to walk more than about half a mile without developing red marks on the heels and soles of the feet. There was a marked tendency for blisters to develop if she walked much further, and this had been a lifelong trouble. She became depressed, from which she was partially relieved by prefrontal leucotomy, though the skin changes were unaffected. She then had a second operation, intentionally in a posterior plane so that the ventricle was entered on both the up and the down stroke on both sides, for a recurrence of her depression. Six months after that she walked 5 miles over the Lickeys in Birmingham without any skin changes at all; further, even though she had continued, after the first operation, a lifelong tendency to sweat profusely, she ceased, after the second, to sweat at all. Between 12 and 24 months after operation, however, tendencies both to blister formation and to sweating began to recur, though in lesser degree.

It is noteworthy that this last patient complained, since her second operation, of the impossibility of keeping warm. This was more strongly put than in most cases after leucotomy, but that some thermal disturbance occurs no one who watches these patients can doubt. It is especially striking how, in the early post-operative phase, they are to be found crouching over the fire, or sitting by the radiator. It is presumably an index of their lack of knowledge of themselves after operation that so often, when asked if they feel the cold especially, they deny it; the denial is totally controverted by observation of what, in fact, they do. A number

undue heaviness of sleep, between 6 months and a year after operation, if not before. Not more than a dozen out of many chronic pill-takers continued to take sedatives, and the reduction of medicines given to patients post-operatively still in hospital was very great. This was somewhat in line with what was also observed in the domain of appetite; namely, a very marked tendency for the disappearance of food fads.

As regards elimination, a daily bowel action was the rule. Nearly all those patients who had been liable to somewhat loose stools before operation, apparently in relation to emotional disturbance, lost this tendency. The tendency to take purges persisted, among the chronic pill-takers, rather more than did the tendency to take sedatives or to continue with food fads.

Menstruation became regular, or approximately so, in 15 out of 19 women in whom it had been absent or irregular before, and in whom such irregularity was not attributable to the approach of the menopause. Seven out of 11 women ceased entirely to complain of dysmenorrhoea.

With regard to libido, it was calculated that in those patients out of hospital and leading any active sex life, there was restoration to their pre-morbid normal in 85%. It was of interest that one manic-depressive man was restored to potency after 8 years of impotence, but at first only in the mornings: by the end of 12 months there was no such variation. In only 3 cases was libido inconveniently increased. Two men made inconsiderate demands upon their wives. One woman, in general somewhat unrestrained, when alone with her husband would raise her skirts and dance in Oriental style, after which she would say, 'Well, Freddy Weddy, what about beddy weddy?' And if he demurred, she would leave amorous notes in the kitchen, which he would find on going to fill his hot water bottle, and which were designed to whet his appetite by a statement of what awaited him in the boudoir. It is to be noted, however, that she was quite circumspect in the presence of other people.

It may be noted, in this connection, that 2 patients complained of post-operative ejaculatio praecox; one of them suffered also from persistent urgency with a tendency to urinary dribbling.

We come now to less well recognized physiological changes. Ziegler, who, with Osgood (1943), reported the occurrence of

unrelated to operation, or a manifestation of the tendency of migraine to undergo spontaneous improvement in middle life. Of psycho-somatic interest also is the relief in 3 patients of asthma; one almost chronic asthmatic was free from attacks for a year, and their recurrence was associated with recrudescence of schizophrenic symptoms.

Finally, mention must be made of the effect of the operation on a 43-year-old man with post-encephalitic Parkinsonism who had had oculo-gyric crises every 3 days. After operation, and on the same dose of the same stramonium mixture, these recurred only every 10 days. The other signs were unaffected. It is notorious that oculo-gyric crises are liable to much influence from psychic processes, but this reduction in their frequency is also reminiscent of the work of Klemme (1939), who has described their production by stimulation of the frontal cortex, and their abolition by cortical ablation.

Summary

(1) There were 23 deaths in this series of 300 cases, of which 4 were unrelated to the operation.

(2) Of the remaining 19, 10 deaths were due directly to operation and/or to post-operative epilepsy.

(3) In addition, the operation is considered certainly to have contributed to 2 further deaths occurring some months after it, and conceivably to 4 more. In the other 3 cases it is a moot point whether or not the operation influenced the outcome.

(4) In the writer's opinion, the operative mortality in this series is 4% and the mortality among the physically fit patients is under 3%.

(5) That this estimate errs on the side of pessimism is indicated by the fact that in a previous series of 500, operated on by the same surgeon, but from which the unfit were excluded, the operative mortality was under 2%.

(6) The figures suggest that hyperpietic women tolerate this operation better than hyperpietic men.

(7) With regard to post-operative epilepsy, 8 patients with a history of an occasional fit before operation had none after it in 2 years and more: 4 others with a history of pre-opera-

of more preserved and perceptive patients, however, when they have got over their early post-operative phase, will complain of undue sensitiveness to cold, felt especially in the hands and feet. In 2 cases in this series the matter was a source of matrimonial dispute, owing to the insistence of the patients in heaping on quilts in addition to extra bedclothes on summer nights already of delicious warmth. These more extreme forms of sensitivity to cold, however, had cleared up within 12 months of operation.

In relation to this, as of academic interest, it may also be noted that 2 patients in this series showed a marked post-operative reduction of enlargement of the thyreoid gland, while 6 women became increasingly hirsute; among these 6 were the 2 who had needed extra bedclothes.

Penultimately, we come to the cardio-vascular system. Although various authors have described changes in blood pressure after operation, and Tibbetts (1949) has described a case whose hyperpiesis fell from 260/160 to 140/95, there were no significant alterations among the patients in this series. There were, however, two other phenomena of possible interest.

A woman of 53 was found, on examination, to have an irregular irregularity of her pulse rate not improved by exercise. Notes from a hospital in which she had been previously show this to have been present 9 months before she was seen, but not during two previous admissions 2 years before that. Since operation her pulse has remained regular. No electrocardiogram was done at any time, and the irregularity may have been due to extra-systoles (though not improved by exercise) or it may have been due to paroxysmal auricular fibrillation. The restoration of the regularity of the pulse may therefore be of no significance at all, and would not be worth mentioning if Freeman and Watts (1942) had not had a case in which established auricular fibrillation underwent a transient post-operative improvement. And Moniz (1936) also had a case, the twelfth of his original series, in which, though the data are confusing and inconsistent, the same thing seems to have happened.

Our last observation connected with the cardio-vascular system is that of 6 patients subject to habitual migraine, 5 have had no recurrence since operation; the sixth remained free for the quite abnormally long period of 6 months. Scrutiny of the case-material does not warrant the supposition that improvement is

19 women in whom it had been irregular or absent before, and in whom such abnormality was not attributable to approach of the menopause. Seven out of 11 women ceased entirely to complain of dysmenorrhoea.

(18) Libido was restored to pre-morbid normal in 85% of patients leading any active sex life, in one case after 8 years of impotence.

(19) Trophic, thermal, and hirsutial changes are mentioned, together with relief from migraine in 5 cases, from asthma in 3 cases, and reduction of frequent oculo-gyric crises in one case.

tive epilepsy had fits post-operatively with much the same frequency and severity.

(8) 10% of patients developed epilepsy after operation for the first time. Ten of those 30 patients, however, had a single fit or a single bout of fits on one occasion only. 6·7% of patients had fits on more than one occasion.

(9) In 5 cases post-operative electroplexy may have played some part in facilitating the development of fits. On the other hand, the possibility of the incidence of epilepsy increasing with the years has to be reckoned with.

(10) Slight urinary incontinence was present in 4·6% of undeteriorated patients after a year and in 3·2% after 2 years; it was a social embarrassment, however, to only 3 undeteriorated cases in all.

(11) Urgency of micturition was present in 66% of cases at 6 months after operation, in 28% after a year, and in 15% after 2 years.

(12) Frequency of micturition was present in 38% of patients at 6 months after operation, in 24·5% after a year, and in 9·3% after 2 years.

(13) There was no significant difference between the sexes as regards frequency, but urgency was nearly twice as common in women.

(14) Increase of appetite was shown in about 80% of cases after operation, but in about half of those this had fallen to the pre-morbid normal within a year, and there was abnormal appetite in only about one-tenth of the cases by 2 years after operation.

(15) Increase of weight was found in 90% of the cases, ranging from a few to a hundred pounds, not necessarily attributable to excessive eating. Two-thirds of these patients became steady in weight between 6 months and a year, mostly at about their pre-morbid normal. A few, all women, continued to gain weight at 2 years after operation.

(16) Sleep was restored to within normal limits in about 90% of cases. In many cases this tended to be at first heavy and dreamless, but in most instances dreams recurred within a year.

(17) Menstruation became approximately regular in 15 out of

system is no mere collection of neurones whose standardized arrangement determines their predestined function, but that there are within it potentialities for change, at any rate to the extent that one part may take over, to some degree, the function of another that has been damaged.

At once, therefore, the question of which post-operative changes are due to illness, and which are due to altered function, becomes more complex than might at first appear. Further, we must recognize that the operation may evoke physiological responses quite apart from those that follow from the damage intentionally caused, and that some of the changes may not occur merely as a result of division, and therefore altered function, of the thalamo-frontal and fronto-thalamic systems. Finally, we are handicapped in our assessment of the post-operative state not only by the ignorance that surrounds the aetiology, pathology, and even psychopathology of psychiatric conditions as a whole, but by the fact that we cannot know, since the operation is still a blind one, the site or extent of the incision, or the amount of accidental damage caused on one or other side or both, in any individual brain.

In the nature of things, therefore, our conclusions cannot be better than guesswork, and this handicap can be offset only by studying large numbers of cases over long periods of time. Even then, the cases must be comparable. With a view, therefore, to removing as many imponderable factors as possible, the case-material presented for consideration of post-operative changes at the psychic level has been drawn only from those patients who were considered to have recovered from affective disorders.

It is necessary to use only the case-material of recovered patients for these considerations, because it is well known that the background of mental hospital life, with its neutral atmosphere, its protection against the world, its mild but supportive discipline, and its unexacting standards of behaviour, is one against which the true extent of personality changes may be impossible to discern. That surprising things are liable to occur when even a 'recovered' patient comes to live in the outside world is an indisputable fact, and one that has been emphasized in the literature by Ström-Olsen (1946) and later by Ström-Olsen and Tow (1949).

PRELIMINARY CONSIDERATION OF CHANGES AT THE PSYCHIC LEVEL

HAVING considered changes at the physical and physiological levels after operation, we come now to changes at the psychic level. Here we are on much more difficult ground, not only because the changes are more varied and more difficult to describe, but also because we have two separate aims in view. We want to know what are the general effects on the patients on whom we have operated. But this is hardly enough. We want also to learn the functions of the tissue we are destroying, and so to lessen our ignorance of the *modus operandi* of this procedure, which we use while understanding it so little. We are obliged to try to do this if, in this particular field, any progress is to be made. But it is not enough, in order to achieve this aim, merely to observe the patients before and after operation, for we have also to decide, when viewing the post-operative state, which of the features that we see are results of the operation *per se*, and which are the residua of illness. It is only by such scrutiny of what the patient has lost and gained that we shall learn what we are doing. Unfortunately, this is not as easy as it sounds. 'The only permanent thing in life,' declared Henry Ford in an epigrammatic moment, 'is change,' and it is in that truth that our difficulty lies. Illnesses themselves may alter with the passage of time and independently of operations, though the latter may retard or accelerate such changes. Thus, the patient may get worse in spite of operation rather than because of it; he may get better not only because the operation has removed some symptoms, but in spite of it, or because it has had the effect of providing a more favourable milieu for spontaneous improvement. All these things seem to happen in fact, though we cannot prove them. In addition to removing symptoms, the operation may add others; then the former may recur, and even the latter change with time. We have, therefore, not only to take into account fluctuations in the illnesses themselves, but we have to bear in mind the increasing recognition, over recent years, that the central nervous

normality as she has stepped into her party clothes. The clergyman's remark, 'Thank heavens, she was perfectly normal when the bishop came to supper,' need cause us no surprise. It is in the family circle, where the patient relaxes, is unbuttoned, and can be himself, while at the same time the environment still makes some demands upon him, that the deficits are most apparent (except for the purely intellectual ones which are most apparent at work). Even here, we must take a dynamic view, for their appearance is dependent on the interplay between the patient and his environment, and is in reaction to outside events. They appear, or are concealed, in accordance with the patient's view of the situation and in accordance with the state of his energy. The patient has far more difficulty in concealing his deficits when tired, and the matter has the appearance of effort being required, and of its not being possible to maintain that effort for very long.

When speaking of 'deficits,' therefore, we are speaking of trends. Just as in schizoid persons the trend of the breakdown is towards schizophrenia, so in patients after leucotomy the trend of behaviour is to show the deficits that we will now consider.

As far as the personality (as opposed to the more purely intellectual) changes are concerned, it is proposed to consider these deficits under three headings: those in the fields of (1) activity, (2) affect, and (3) restraint.

Of course, such a division is arbitrary and artificial; in the end it is even fallacious. For, to take a simple instance, to worry is an activity with an affective connotation, and so, when a patient does not worry, who is to say if the deficit lies in the field of activity or in the field of affect? And who is to say where restraint ends and activity begins? How much is selfishness to be attributed to emotional blunting, and how much to unrestrained behaviour? How much is outspokenness due to insensitiveness, how much to lack of effort in checking it, how much to inability through unrestraint? Endless questions of this sort might be posed. Yet, on due consideration, some classification such as that which is proposed seems helpful, as making for ease and some orderliness of approach.

Cases who have recovered from affective disorders have been chosen because it is considered that these last show, on recovery, less in the way of residua of illness than do any other psychiatric conditions, and so offer the best chance of assessing the changes due solely to operation in an otherwise recovered person. That is, they may afford something like a paradigm of the best that can be hoped for, and at what cost in the way of accompanying deficits.

The writer is fortified in this decision by the knowledge that personality changes of the sort about to be described do occur, in fact, in the other groups of illness, and to a greater rather than to a less extent are common to all patients. The clinical picture, therefore, is not rendered misleading by this restricted choice; on the contrary, it gains in accuracy. And should the reader wish to observe the more complicated conditions that result from the colouring of the post-operative state by schizophrenic, manic, obsessional, and psychopathic residua, he will find some account of them in the sample case-histories.

Personality Changes

There were 60 patients who were considered to have recovered from affective disorders after operation, and all of them were able to resume their lives in much the same way as they had lived before they had been overtaken by their illnesses. In view of the severity of the latter, this is sufficiently remarkable. Yet, every patient had deficits of some sort.

It must here again be stressed that when the term 'deficit' is used, it is not intended to imply a deficiency that is at all times present, in the same sense that a patient after appendicectomy is always without an appendix. Our preliminary considerations, in relation to the importance of seeing the relatives when following the cases up, as well as those in the last chapter, have warned us against such a view. We must conceive of these 'deficits' in some more dynamic way, much as Alford has pointed out (1943) in his conceptions of aphasia. Patients are able to conceal their deficits in a surprising way, and to overcome them to a surprising extent. In this series, even a dysphasic post-operative vegetable was able to behave at parties so that strangers saw nothing wrong with her, and many a nagging termagant has stepped into

months after operation, than had formerly been their custom. Of course, some of them had acquired the habit from long residence in hospital, but even so they showed no desire to be weaned from it. Retirement between 7 and 8 o'clock was not uncommon. Twelve months after operation, 33, or more than half, continued in this way, and one man went to bed at half-past six. Those who stayed up as late as 11 o'clock were rare, and it was usually found either that retirement in the small hours had been their custom, or that they stayed up because they felt too inert to make the necessary move to bed. A third of the patients still showed this trend when 2 post-operative years had elapsed.

Forty-four of the patients, or more than two-thirds, complained of being, or were noticed by the relatives to be, slow: slow in the exec [illegible] in dressing and in u [illegible] in general. After a year this observation was still made of 37. After 2 years, perhaps through difficulties of observation, the number had fallen to 15.

Lack of spontaneity was obvious in 41 of the patients at 6 months after operation. 'He doesn't have as much to say.' 'She doesn't tell you what's been happening unless you ask her.' 'She will talk but you have to start the conversation.' 'Oh yes, he'll answer, but it's you who've got to keep the conversation going.' These are the sort of comments that were made. Indeed, comparison of the post-operative with the pre-operative interview showed often the remarkable substitution of a monosyllabic economy of answer for a querulous logorrhoea. The patients were liable to tolerate with perfect equanimity, and without any attempt to fill a conversational gap, intentionally provocative silences lasting over several minutes. After 12 months there was a great reduction in this: it was noted in only 18 cases; and after 2 years in only 12, all of whom had been people with a tendency to the taciturn before.

Lack of persistence, in the sense of drifting away from some task to something else not more important, was observed by the relatives—in contrast to the patients' pre-morbid habit—in 39 cases at 6 months, and in 34 at the end of a year. After 2 years it was noticeable still in 28.

The tendency to get up late, so distressing to the overworked

Deficits in activity

Activity depends much on initiative; initiative depends much on interest; interest depends on the situation, and on the reaction to that situation of the total personality. Here there are so many variables that the comparison of post-operative with pre-morbid activity cannot be made on a quantitative basis, except in a few individual cases where it happens to be glaringly apparent. We can, however, take as a base-line the observation that, running through the whole range of cases, there was one change which can be best described by saying that the patients were more relaxed. This is saying much the same as that the tension was reduced. It is easy to see that, stemming from this basic change, there is likely to be reduction not only of the total activity, but of interest and initiative. And so there is, though this may be shown in quite subtle ways which defy the grossness of clinical observation unless some especially favourable opportunity chances to fall in the way of the observer.

Looking at the matter in the gross, it certainly appeared that there was a reduction in the patients' total energy. That is a matter that we cannot prove, but we can say that there was a reduction in their total activity, whatever the cause may have been. Certainly, 52 of the 60 patients complained of being, or were noticed by their relatives to be, unduly tired at 6 months after operation; after 12 months this number had fallen to 41; after 2 years the assessment was, of course, more difficult as both the patients and the relatives had become accustomed to the post-operative state and, with the passage of time, their memory of the pre-morbid state had lost distinctness, but it can be said that undue fatiguability persisted in 18 of them.

Apart from this, 49 of the patients, at *6 months after operation*, were considered to be noticeably less active than before they were ill—in some cases grossly so, though in all instances some due allowance was made for advancing years. This showed itself in such ways as going out less, the cessation of such active hobbies as walking, games, and gardening, ceasing to dance when they had been keen on this before, and a tendency to loll unoccupied in contrast to a previous habitual activity.

Forty-six of the patients were still going to bed earlier, at 6

does not necessarily run parallel to the inward experience, and it is difficult both for the patient to describe and for the observer to interpret.

There was, however, one deficit which ran through all the patients, and which appears to be the affective correlate of what we have already taken as a base-line in considering the activity: that general reduction which finally resulted in the state described as 'not being on tip-toe.' It would be a great exaggeration to say that the patients did not worry, but there was not one who could worry as much as in his pre-morbid state. This was the most noteworthy and the most general affective change; it varied in degree from case to case, and in the same case in different situations. Just as we noted how such forms of behaviour as interest and initiative might be influenced by a basic reduction in activity, so too do such forms of behaviour as appreciation and thoughtfulness for others depend on the degree to which the person worries. In fact, the tendency not to worry and the tendency not to be on tip-toe seem only to be different aspects of the same central and basic entity, the degree of tension to which the patient is subject.

At 6 months after operation, none of the 60 patients could worry as much as had been their wont; at the end of a year this alteration was less marked, but only 6 patients had begun to worry to an appreciably increased extent; at the end of 2 years the assessment was again more difficult, but it is doubtful that any of the patients was capable of the degree of worry that they had shown before.

Any finer shades of affective change, other than this tendency, were either unnoticed or could not be described by the patients, and could not be deduced by clinical observation, but there were 13 patients who, though no longer complaining of depression, described some loss of feeling in a quantitative sense. 'In my heart I've no pity or feeling, and I used to have.' 'I don't feel the same, I'm not sentimental like I was, it's hardened me.' 'I don't think I have as much feeling.' 'I never really get excited about anything now.' 'I've definitely less feeling than I used to have.' 'Things don't seem to mean the same to me.' 'I'm not so emotional, I'm not stirred like I was by books or films.' These are the sort of comments made by those patients who did not appear

staff of hospitals, was found in 33, or more than half of the patients at 6 months, and in 22 at the end of a year, in whom it was still persistent at 2 years after operation. This was not, however, more than a tendency and was a matter for comparison with previous habits.

Finally, 17 patients had taken to an afternoon rest, and were enjoying this at 6 months after operation; 10 of them still did so after a year. None of them had done so before.

Six months after operation every patient showed some combination of these deficits; it will be seen that there was a tendency towards improvement over the ensuing half-year, especially in the return of spontaneity. At the end of a year there were 4 patients in whom such changes could not be detected, though that is not to say that they did not exist. At the end of 2 years the number of patients in whom there was no satisfactory evidence of reduced activity had risen to 8.

We are left with the difficulty of trying to convey the extent to which such changes have taken place. An attempt will be made to portray this in the later section which deals with the post-operative performance as a whole. We must here content ourselves with the knowledge that by 12 months after operation, the deficits in activity are not gross, except in a small minority of cases. Here again it is a matter of comparison with previous habit. Fifty-two of the 60 patients led lives which could not be regarded as other than normally active, although in 40 of them they were not quite what they led before. Two more of them led lives which, in the writer's opinion, were within normal limits of activity, though towards the lower end of the scale. Only 6, therefore, led lives in which the inertia was sufficiently marked to be noteworthy in the absence of comparison with previous habits. Of the others, the end result is perhaps best described by the words of a wife about her husband: 'He's never on tiptoe now.'

Deficits in affect

These are exceedingly difficult to assess. In a 'normal' or recovered person, affect would seem clinically inseparable from activity, since both would seem essential attributes of behaviour. But it is less susceptible of estimate in that its outward expression

which suggested an abnormal shallowness of affect. They denied any change in themselves, but the relatives said: 'She doesn't feel things as deeply.' 'Everything is quite superficial.' 'She's shallower than she was.' 'He's quite a tolerable and pleasant old man now, but he's simple.' Of these 7 patients, 4 seemed to undergo no change as time went on, but the other 3, although appearing emotionally the same as judged by interview, became gradually much more considerate in conduct: so did the 5 who had shown the tendency only in an intermittent way.

There were also 5 patients who gave every appearance of, and were considered by the relatives to show, a diminished affective responsiveness (as judged by lowered animation, type of conversation, reactions to situations, and attitudes towards the family) but who insisted that inwardly they felt no different. These 5 patients showed rather marked inertia. At the end of 12 months one was leading a normally active life, and in the opinion of her husband (which accorded with the writer's guess) had returned to her affective normal. The other 4 had shown some, though less marked, return both of affect and of activity.

Lastly, there were 9 cases who also denied change of feeling, and the change in whom was not apparent at interview, but whose relatives showed convincingly that such change was present. Apart from citing examples, they gave such verdicts as: 'Oh, definitely she's not so affectionate.' 'He's not so considerate to me, he doesn't show as much affection.' 'She's quite unemotional, doesn't mind what happens to us.' But these patients differed, to outward appearance at any rate, from all of the foregoing in that they seemed to show no quantitative loss of affect, they were not fatuous, nor dulled in response, as shown by their capacity for enjoyment. There may have been a quantitative reduction or there may not; there was certainly some redistribution, with more tendency to seek personal pleasure, which was interpreted as a quantitative deficit by those who had been the chief objects of their affections before. The lack of restraint, which was marked in 6 of the 9 patients, aided this redistribution by facilitating selfishness. There was very little, if any, appreciable change in this state of affairs with the passage of time.

The affective deficits, then, may be summarized by saying that the general finding was a reduction in the capacity to worry, less

to be even mildly depressed, and who said that they were not. A particularly good description was given, and is mentioned here for interest, by CASE 251, page 293, who was, however, recovered from a recurrence of schizophrenia with a manic colouring, and whose account does not therefore come strictly within our terms of reference. That more than 13 out of the 60 cases did not make these observations may be due to many factors; they may not have been good observers, they may have lacked insight into themselves, they may have lacked the verbal facility, they may not have troubled to notice, they may have noticed but with post-operative heedlessness have failed to bear the fact in mind, while in many the extraversive effect of the operation may have turned them from the necessary consideration. At the end of a year all 13 cases showed some noticeable return of their affective responses, as far as could be gauged by their description, by the degree of animation which they showed, by the play of facial expression and varying inflection of the voice. They all showed an increase of activity which ran approximately parallel. By the end of 2 years, they had become so accustomed to themselves that pre-morbid comparisons again were difficult, but the result might be expressed in general terms by saying that their emotions seemed within normal limits to themselves, though with a reduction in sentimentality, where this had been shown before.

So much for the finer shades, but there were 12 patients in whom a noticeable abnormality was apparent on clinical observation, in the form of what may be called 'fatuousness.' They were fatuous in the sense that they treated with jocosity matters that were reasonably considered by their relatives to merit earnest attention, and they showed no insight into the consequences that might follow adoption of their attitude. This tendency was not necessarily more than intermittent, but it showed altered values that stood out in contrast to those of their relatives. One man, who gave the matter an unusual amount of consideration, had insight into this: he had been overheard by his wife telling himself 'not to be fatuous,' and (though ignorant of the literature) used the very word in describing himself at interview. In 5 of these patients the tendency was only intermittent, but 7 of them showed in a sustained way a state of bright and animated triviality,

Thirty-three of the 60 patients showed outspokenness in various ways at 6 months after operation, in a fashion previously foreign to them. Thirty of them showed it after a year, and the number did not decrease by 2 years after operation.

Thirty-two of them showed snappishness at 6 months after operation, who did not have the habit before, and 33 of them showed it after a year, while 2 years after operation it could be discerned in only 30. But those patients who were snappish and/or outspoken after a year or after 2 years, were not all the same patients who had been snappish and/or outspoken at 6 months after operation. On the contrary, as the spontaneity gradually returned so the lack of restraint, in some cases, became more obvious; special situations also played a part, so that in some cases events occurring at some distance after operation caused changes to be revealed that had not been obvious before.

Thirty-one patients were less unselfish than before they were ill, and 30 remained so thereafter.

Sixteen patients, at 6 months, showed frank bad temper (or snappishness of major degree) to an extent greater than they had shown before, and 12 still showed this after a year.

Fifteen patients showed extravagance, in only one case gross, but in all in excess of their former habits, as a general characteristic over the 2 years after operation.

Fifteen patients were greedy and unrestrained in eating at the end of 6 months, but only 8 by the end of a year, while after 2 years no more could be said than that they had good appetites and were fond of a snack between meal times.

Eleven patients, not accustomed to bad language, were using this at 6 months after operation, 9 still did so after a year, and 7 continued so to do.

Eleven patients showed a tendency to inconsequential conversation, in the sense that, contrary to previous habit, they inflicted chatter on other people which was of interest only to themselves; after 12 months this number was increased to 14. The increase was an indication that the improvement in restraint did not run parallel with the return of spontaneity.

Seven patients took to excessive smoking, which they had not done before, and over the 2 years only 3 of them improved in that regard.

marked as time went on: that only 13 out of the 60 patients complained of affective loss in any quantitative terms, all of whom showed a tendency to return to normal: that 12 patients showed an intermittent fatuousness, 7 of whom showed a persistently shallow affect which did not change: while 9 cases showed an affective redistribution in that they enjoyed themselves the more, but were less demonstrative to others. There was a general tendency towards return of affect which ran approximately parallel to the return of activity.

As regards the extent and effect of these affective changes, again, some attempt will be made to show them in the later section which deals with the patients' performance as a whole. It must suffice to say here that the quantitative loss of affect complained of was really no source of distress to these patients (CASE 251, page 293, a formerly schizophrenic patient, and CASE 275, page 339, also a formerly schizophrenic patient, were exceptions), but they themselves preferred the post-operative to the pre-morbid state. The patients who were fatuous, and who appeared to have a quantitative affective loss but denied it, and who appeared to have no affective loss but, on the other hand, an affective redistribution, felt no distress at all. The effect on the relatives, however, varies too much from case to case for any general formulation of the matter to be made at this point in our considerations.

Deficits in restraint

Restraint implies three factors: the activity which is to be restrained, the counter-activity which does the restraining, and the 'set' of the patient which helps to determine the outcome between the previous two. The counter-activity is the essential feature, and it would be tempting to consider its absence as merely one aspect of that general reduction of activity which the patient tends post-operatively to show. Unfortunately, if there is any such relation it is not a simple or direct one; unrestrained patients appear among the most and among the least active, as well as in the middle group; they are sometimes those who make the greatest efforts, sometimes those who make the least, and sometimes those who take a middle course. Often, but not always, this lack of restraint is the freer post-operative expression of some subdued hostility which the patient has formerly held in check.

[illegible] of his return there, and [illegible] it. These were contributory, no doubt, but they do not seem adequate to explain the whole. Eighteen months after operation the patient had settled down, had taken to working hard on his allotment, seldom drank, and, though snappish, was peaceable enough. It may be noted that he never actually struck anyone, but his behaviour was sufficiently alarming and coercive as virtually to amount to violence.

When the material with which we are dealing is considered, the incidence and degree of violence shown by all patients in the series is surprisingly small. Indeed, taking into account the lack of restraint that seems in many cases inevitable after operation, this sequel is far more mild and infrequent than might have been expected. This is presumably because any such tendency to unrestraint is more than offset by that combination of emotional blunting and reduced activity which is sometimes referred to as 'lowering of the drive.'

These deficits in restraint cause the patients very little concern indeed. On the other hand, they are the deficits that are the most vexacious to the relatives. An attempt will be made to show something of their extent and effect in the life situation, in the section which deals with the performance of the patients as a whole. It may be noted that there is less tendency for return of restraint than for restoration of activity and affect. This may perhaps suggest that the tendency to unrestraint may be a deficit in the truest sense of the word, as a loss of function due to the actual and irreversible reduction of cerebral tissue; whereas the alterations in affect and activity may be due in larger measure to alteration in physiological mechanisms, the resilience of which allows a greater measure of post-operative adjustment. Such a view would be in line with that suggested by Freeman and Watts (1942) and elaborated by Cobb (1943), which conceives of the pre-frontal areas of the brain as being concerned, by the long circuiting of impulses, with functions of delaying, modifying, and repressing, which tend to the prevention of impulsive acts and so to the formation of mature and considered judgments.

Three patients, one of whom was a chronic alcoholic and another of whom had had occasional bouts of drinking, took alcohol in excess at 6 months, and continued thus at 12 months, but only one of them persisted in the habit beyond that time. The increase in smoking and drinking was considered to indicate unrestrained enjoyment rather than a symptomatic attempt to allay an inner need.

Four patients showed violence. These were isolated episodes in 2 cases, both the result of provocation and of provocation by people who had long aroused smouldering but subdued hostility in the patients concerned.

In one case there had always been a struggle for moral ascendancy between a wife of strong personality and an insecure husband, whose repeated illnesses had obliged her to assume the dominant role, to his secret resentment and humiliation. He swore at her in an argument, and she slapped his face as he was being unreasonable and self-assertive. He retaliated by bruising her extensively and loosening two teeth. Neither were people in the least accustomed to such expressions of domestic friction. In another case, the tough and unsympathetic mother of a hysterical psychopath (operated on for a depressive illness) threatened the patient and tried to strike her, on which the patient retaliated. In the third case, Case 81, with psychopathic traits who, at times of dissatisfaction, had previously taken to alcohol and been a tyrannical bully in a periodic and occasional way, found himself bored in idle retirement. He drank to pass the time, and unrestraint led him to excess. It was then particularly that he would upset the household by blustering threats, but at other times too he would show himself to be the master by frightening his wife and daughter with his furies. He made absurd commands, such as that a pudding his daughter was making must be thrown out of the window, the whole house must be turned upside down in order to find something of small moment, and when the thought came to him that Christmas Day was not as merry as it might be, he shouted that it was a mockery, tore up and burned the Christmas cards, and threw things about the room. The dynamics of this (and whether it might not be due to persistent cortical irritation) were difficult to understand. Certainly, the wife and daughter had combined together somewhat to exclude him, he was long since tired of his wife (particularly of her somewhat rigid respectability), he was resentful of their having arranged his dispatch to a mental

due to the actual and irreversible reduction of cerebral tissue, whereas alterations in affect and activity may be due in larger measure to alteration in physiological mechanisms, the resilience of which allows a greater measure of post-operative adjustment.

Intellectual Changes

Everyone thinks that he knows what intelligence is, but there is hardly anyone who can define it. Certainly the way in which the word is used by the academic psychologist is quite different from that in which it is used by the man in the street. The investigation of intelligence is the most notable contribution of psychology, and it has resulted in the isolation of a certain function which, while not the same as intelligence as the layman uses the term, is yet the nucleus of it. Although the essential nature of this property is not yet fully understood, it can be measured within certain limits of accuracy. Such measurements have yielded the information that the individual is endowed with this property at birth: that, like the rest of the individual, it undergoes a process of maturation, but—contrary to popular belief—if expressed in terms which relate it to the individual's age, it remains approximately constant in a quantitative sense, through life: that the climax of this maturation is reached—again contrary to popular belief—probably between the ages of 14 and 16 years: that—contrary to expectation—it is not increased by knowledge, nor dulled by disuse.

Thus, while the layman might hold that a competent and middle-aged solicitor was more intelligent than an ordinary child of 7 years, the psychologist might well deny such a contention. Each might be right within his own use of the word. The psychologist would be concerned with a basic, nuclear property which was an index of the child's capacity, and would claim that what the layman was considering as intelligence was this same basic and nuclear quality together with the added and quite extraneous factors of knowledge and experience. He would argue that, while the solicitor would be able to deal more competently with worldly affairs, such greater competence would arise only from practice, and not from potentiality. It would be

SUMMARY

(1) In the hope of gaining some knowledge (of the effects of the operation, of its *modus operandi*, and of the functions of the tissue which it destroys) it was felt desirable to compare the pre-morbid and the post-operative personalities.

(2) Owing to the difficulties of comparison caused by the latter being so variously coloured by residua of illness, only the personalities of those patients who had recovered from affective disorders were considered.

(3) These were chosen in the belief that recovery from such conditions is usually more complete than from other psychiatric disorders, and that such post-operative states afford the best chance of observing the effects of pre-frontal leucotomy in pure form.

(4) There were 60 such patients.

(5) Every patient was found to have a deficit of some sort. These were neither permanent nor invariable, and could be concealed to some extent. They made their appearance in response to situations, and otherwise were influenced mainly by the state of fatigue of the patient. In fact, such 'deficits' were trends in behaviour, as opposed to fixed abnormalities.

(6) The deficits were considered under three headings: those in activity, affect, and restraint. This division is arbitrary and artificial, but convenient.

(7) Deficits common to all patients were reduction of activity in general, and as an affective correlate, a diminished tendency to worry. The extent of these varied in different patients and in the same patient at different times.

(8) More specific alterations in activity and affect are mentioned, occurring in some patients only.

(9) The deficits in restraint did not run parallel to the others; some tolerably active patients with moderate or high affective charge were unrestrained, and vice versa.

(10) There was a general trend for activity and affect to return to normal. This was less noticeable as regards restraint.

(11) The possibility is mentioned that the loss of restraint may be a deficit in the truest sense of the word, i.e. a loss of function

more cheerful and comfortable, but augured well for economy of work. But even a hopeful traveller must face the facts when he sees a wrong name on the station.

Unfortunately, when this investigation started it was supposed that the help of a psychologist could be secured. In that expectation, preliminary methods of examining intellectual function were neither explored nor worked out by the writer. When the investigation had got under way, and it was necessary to see the patients before they were operated upon in order to keep the series as consecutive as possible, a time factor began to enter to some extent, which delayed further the formulation of such methods. Then, in the earlier cases, application of tests designed to show failure of conceptual thinking gave some negative results. And it took a considerable time, and the cumulative effect of many small (and some may say trivial) observations made more rather than less by chance, before the writer was awakened to the fact—as he believes it to be—that the then prevailing views as regards post-operative intelligence were not borne out by the cases that he saw. Thus it has come about that the reader's indulgence has to be asked for this impressionistic presentation, derived from observing experiments of nature rather than from planned and controlled investigation.

There are crumbs of consolation, however, in the reflection that it would have been impossible, on grounds of time alone, satisfactorily to test these cases without the help of a psychologist, even had realization come sooner. And it is doubtful how far the sort of deficits that were observed would in fact have been demonstrable by such tests as are ordinarily employed.

The tests used by the writer were, of course, of far too simple and primitive a kind, and, as this was a clinical investigation, consisted only of those which form a part of any routine and formal examination of the mental state. While these certainly showed deficits in some cases, they were not of a kind to show the far more recondite intellectual changes which tend, in the writer's opinion, to develop.

Thus, the patient was asked questions designed to elicit his degree of orientation: he was asked to repeat digits and to reverse them, serially to subtract 7 from 100, or sometimes (to avoid practice effects) 8 from 109: he was asked to remember a name,

the different usage of the same word that would give rise to the difference in view.

As to the nature of this basic and nuclear quality, there is no certain knowledge, but without entering into academic argument, it can be said that it probably consists of the ability to perceive the relationships between one thing and another.

In considering the question of intellectual deficits in patients after pre-frontal leucotomy, the preliminary question must arise as to whether any seemingly less intelligent behaviour on the part of the patient is attributable to a reduction of his intelligence, using the word in the academic psychologist's sense, or whether his intelligence remains the same, but he is prevented from putting it to the same use as formerly by changes in his temperament and personality.

This is certainly not always an easy thing to determine, but it may be said at the outset that the writer finds it impossible to accept the view that some psychologists have put forward; namely, that intelligence is unaltered by this operation. And that is so, in whichever sense the word may be used.

Such a remark, from one so unqualified to make it, may be considered aggressive and over-bold, especially when it is followed by the admissions that not only is the writer unable to offer proof of his opinion, but also that it is at this point that his investigation is least reliable.

The objection may be raised that any intellectual deficits that may be found are due not to the operation itself, but to the deleterious side-effects of accidental damage. It is, of course, *a priori* likely that the greater the accidental damage the greater are the chances of intellectual impairment. But who is to say that with an operation optimally performed and without accidental damage, there will be no intellectual changes at all? No one can assert this, and, if he did, it could only be on the ground that none was demonstrable. And that would inevitably raise a question as to the adequacy of the tests employed.

The writer, who is a hopeful traveller, did not embark on this investigation with any preconceived ideas of this gloomy kind. On the contrary, he accepted what appeared at the time to be current psychological thought that intellectual impairment was not a sequel of pre-frontal leucotomy. Such a belief was not only

the month, making 100% error in the length of time since leaving hospital, etc. All were fully orientated in this respect at the end of a year in response to formal questions, but doubt was felt in many instances that their estimate of the passage of time was as accurate as might have been expected.

In the sensorial tests, some of the patients did better after operation than they had done before, some worse, and some showed no appreciable difference.

On retention of digits some patients improved and some deteriorated, with no general change. If retention of 6–8 digits forwards be the average expectation (as is commonly alleged and as is stated by Muncie (1939)), only one of the patients fell below this level, and even that was an improvement on her pre-operative performance.

On the other hand, with reversal of digits there was more difficulty. Twenty-six of the 35 patients showed a reduced ability to reverse digits, and in no instance was the ability increased. Further, there was a marked discrepancy after operation between the ability to retain digits forwards and the ability to reverse them; one patient capable of retaining 8 digits forwards was able to reverse only 3. There was no appreciable tendency towards improvement as time went on.

With regard to less immediate memory, as tested by recall of a name, address, and flower after 5 minutes, there was no appreciable post-operative change.

There was a slight tendency to make more mistakes on serial subtraction of 7 from 100 after operation, but there was on the whole less hesitation in performance. There was no appreciable improvement with the passage of time except in a few cases who had made very numerous mistakes.

In comprehension and retelling of a simple story (Bleuler's cowboy story was preferred, but where patients were able to remember it after operation, the alternative story of the donkey was used) 10 patients were unable to give a satisfactory rendering at 6 months after operation, and indeed 5 were able to give neither the point nor the main details. There was, again, a tendency to improvement, but 4 were still unable to give a satisfactory rendering at the end of a year after operation.

In subtraction of money there was more difficulty than in

address, and flower for 5 minutes: he was told a simple story and asked to retail the gist of it with the relevant details: he was asked the difference between a boy and a dwarf, and between a lie and a mistake. Unfortunately, owing to lack of proper planning, the patients were not asked pre-operatively to perform sums in the addition and subtraction of money, and only a limited number of them were asked to interpret proverbs.

A number of the patients were pre-operatively quite inaccessible as regards such testing, through agitation, intensity of pre-occupation, distractibility, and weeping. In other cases, the pre-operative performance must be presumed to have been below that of which they were normally capable, by virtue of their state at the time. Further, in quite a number of instances even in the recovered patients, it was not felt that their post-operative performance represented their abilities, since there was sometimes a tendency to regard sensorial tests with an attitude that was either desultory or one of good-humoured levity. Such patients approached the tests rather as an adult who has something better to do may humour a child by partially participating in a game, but only just to an extent which will prevent importunate clamour. Such results as were obtained, then, tended to be an index of attitudes rather than of abilities. In the group of recoveries from affective disorders to which, for reasons already given, we have hitherto confined our attention, there were only 35 patients whose testing was considered to give reliable indications. The conclusion that there is a liability to intellectual impairment by no means rests, however, on these results alone; more convincing were observations which were sometimes afforded only by chance, but are not for that reason to be rejected as without diagnostic value because they were unplanned.

As regards orientation, all the patients were orientated for place and person by 6 months after operation, though one woman who had been interviewed by the writer twice at length, and who had been on familiar chatting terms during frequent meetings over a period of a year in hospital, was unable to recall him when meeting on unfamiliar ground 6 months later, even when told his name and the place of their former association. Five patients were disorientated in time, however, in a gross way at 6 months after operation: such as being a week out in the date, not knowing

Q. 'You said that it meant one should not criticize other people if one's open to criticism oneself.'

A. 'Oh?' *(looks puzzled).*

Q. 'Which do you think is the better answer?'

A. 'The one I gave you to-day.'

The interpolation of remarks of this sort into an otherwise intelligent conversation by a person accustomed for years to office work of quite complicated and responsible kind, is bound to suggest the presence of deficits which the other methods of testing have been too gross to elicit. And in interpretation of proverbs, as in other answers to questions, the productions of patients were post-operatively less ample and in general less adequate, showing them to be satisfied with a lower level of performance.

The results on testing in those simple ways were, therefore, not such as to indicate any general and permanent intellectual impairment running through the cases as a whole, except such as might be indicated by a reduced ability in reversal of digits. Yet, it is odd that one-fifth of the patients should have been only partially orientated in time at 6 months after operation: that 10 other patients should have been unable to retail a simple story, who had been able to before: that as many as 23 patients should have been unable to do simple sums in their heads in spite of having had a reasonable education (though we do not know what their actual performance would have been before operation), and that one-tenth of the patients, previously able to interpret simple proverbs, should attach to them literal and specific meanings instead of the general conceptions that they gave pre-operatively. Surely, in these matters we have a hint of some intellectual impairment that must be reckoned with to the extent of giving the matter further consideration.

We must add to these findings some other observations.

The post-operative state, which we have already described, of 'not being on tip-toe,' implies in some degree a reduction of attentiveness. The finding of psychologists (e.g. Yackorzynski and Davies (1942)) that patients do not perceive, after operation, as many stimuli in a given field at the same time as they were able to perceive before, is therefore not surprising. Equally, it is to be expected that patients will not show the same adroitness in distributing their attention. At 6 months after operation this was

addition, in which latter mistakes were rare. It has already been explained, however, that none of the patients was tested in this way before operation; but the degree of difficulty found post-operatively with these simple sums (4/1–2/10; 3/3–1/9; 7/2–4/8) was rather surprising. In 9 cases in which patients got each subtraction sum wrong, and the same test was carried out on a relative in the household, the latter got all 3 sums right in 7 instances, and in no instance was there a failure equally gross. When the sums were written on paper, every patient was enabled to do better: half of those who had got none of the sums right in their heads got them all right on paper, and the other half showed varying degrees of improvement. Twenty-three of the patients failed to get all the sums right, while 11 of them got all the sums wrong. All the patients said that they were quite able to calculate the change in shops, when dealing with the actual coins, and their relatives had no doubt that this was so. One was left, however, with the feeling that much depended on the honesty of the shop-keeper, and inclined to wonder how general was this difficulty in calculation among the public at large. The performance was slightly better at 12 months after operation than it had been at 6 months, in more cases than not.

In interpretation of proverbs, that tendency stressed by Goldstein (1932, 1936, 1941) for patients with damage to the pre-frontal cortex to think in concrete rather than in abstract terms, might be expected especially to emerge. It did so in 11 cases out of 35. That does not sound startling; but in fact a conversation such as the following, conducted with a serious woman who has been sensibly and even intelligently chatty, and who has then proceeded through the sensorial tests without gross failure, can be very startling indeed.

Q. 'What does it mean when one says, "People who live in glass-houses shouldn't throw stones"?'

A. 'Well, of course they shouldn't, why, ha ha, they'd break the glass.'

Q. 'But is that what it means?'

A. 'I suppose so; yes, of course.'

Q. 'It's not the answer you gave me when I asked you once before.'

A. 'Oh? What was that?'

but without effort at correction. In retention of digits, as the tests became more difficult, there was often a tendency (not previously present) to fabrication of answers that had practically no relation to the original, rather as an inexpert snooker player with no chance of scoring may have a random shot, just because it is his turn in a game undertaken more to oblige another than to amuse himself.

On reversal of digits, there was a remarkable tendency for the patients, although tested in that way before, not to grasp the fact that they were being asked to repeat the digits backwards. Although told, they would repeat them forwards; they were corrected, perhaps more than once, and then would reverse them, but at the next trial they would merely repeat them forwards again.

Some of the patients also tended to approach one test as though still doing the one before. One patient, for instance, was able to remember correctly a name, address, and flower after 5 minutes, but she seemed somehow to view it in the light of what she had been asked immediately before—namely, the difference between a lie and a mistake—and she began to wonder if the man who had lived at that address with that flower had told a lie, or if, after all, he had only made a mistake; nor did she give the least appearance of pulling the examiner's leg. Another patient, having grasped with some difficulty that it was required of her to reverse digits rather than to repeat them forwards (though she had done it before), was asked to do subtraction sums: she was then asked serially to subtract 7 from 100, and made a curious blend of the two, by trying serially to subtract 7 from the sums of money. There were other examples, and they were not confined to the matter of tests; in general conversation it would sometimes be found that the patient was still talking in connection with some previous item, although the conversation had been unmistakably changed. One woman, for instance, insisted that she sometimes went for several days without passing water; pursuit of the matter showed that she had reverted to a topic of a minute or two before; namely, her alimentation.

Another thing that emerged in general conversation, without being specially tested for, was that the accounts given by patients of events in which they had participated, or of films they had

clinically observable in gross form in 29 out of 60 undeteriorated and *recovered patients, in 18 of them after a year, and after* 2 years in only 10.

For example, some time was spent one day in helping a patient to unravel a quantity of tangled wool: it is difficult to conceive of a task which would require less concentration than the mere holding of some wool while someone else unravels it: yet the patient was quite unable to do sensorial tests at the same time, so that she had to drop the wool to do the tests: the writer had no difficulty in doing both at once. Again, a patient was too preoccupied with her own conversation to notice that a kettle was boiling over: another patient required the stimulus of hearing the boiling water hiss as it nearly extinguished the gas-ring because his attention had been focused on what he was saying, though the writer had heard the kettle boiling in the next room for some minutes before it finally boiled over. A further patient, having boiled the water with the tea things ready was too occupied with what she was saying to make the tea, and the water had to be boiled a second time. Another was seemingly unable to talk and to drink tea: advised several times that her tea was getting cold, she picked up the cup, but continued to talk, and in this fashion was provided with three cups in succession, not one of which she had tasted: she finally declared that so much talking had made her intolerably thirsty. Similarly, at meals it is striking, in comparison with other people, how the leucotomized patient occupied in attending to his own wants entirely fails to note the wants of others Domestic examples of this sort could be multiplied almost in definitely. This is not to say that the patient is *unable* to alternate his attention, although it is possible that fine tests would show that; in each instance where these observations were made the patient was, of course, pursuing the line which interested him more and neglecting that which interested him less, and all that we are able to conclude is that the patient, in the life situation, does not alternate his attention adroitly in fact, probably as a result of the lowered post-operative tensions. These observations depended purely on chance, according to the situation in which one happened to see the case, and it is likely that this maladroitness was actually present in far more cases than those in which it happened to be observed.

In performance of the tests themselves, there was a noteworthy tendency towards carelessness, so that gross mistakes were tolerated by people who would have been expected to know better. The patient would often add, 'I don't think that's right,'

With regard to the accounts of films, books, or plays, this tendency was more obvious. Several patients remarked to the effect that they knew what these were about, but could not explain, and several relatives remarked on this tendency also. An astounding example was a cultured woman who did little but read Victorian novels all day, and was noted by her husband to be unable to say what any of them were about. When asked what she read, she said, 'Old books.' When asked by whom, she said, 'Oh, Dickens, Dickens and . . . oh well, people like that.' 'Thackeray?' 'Well, I'm really not sure.' 'Trollope?' 'Yes.' (On inquiry it was found that she read only books in the house, and there were no books by Trollope.) 'I understand you've just read *Two Years Ago*, and that you finished it yesterday?' 'Yes, I did.' 'Well, I've never read it: what's it about?' 'It's Two Years Ago.' (She had read it the day before, not two years ago.) 'Yes, but what's it about?' '*Two Years Ago*, it's by . . . why, it's by . . . let's see, who *is* it by?' 'It's by Kingsley.' 'Kingsley? Is it? Is *Two Years Ago* by Kingsley?' 'Yes, it is, but what's it about?' 'Well, it's . . . it's some . . . well . . . to tell you the truth I read so many books I think it is very difficult to keep them separate in one's mind.' She then went on to say that she had read 'that book by that woman like a temperance writer. What's her name? Awful woman. I'll never read another. Oh, I can't tell you what it's about. What's it called again? It's something House.' Bleak House was at this point mischievously suggested, and the suggestion was not rejected. Really, the only things on which she was right were that she read a great many old books and could not keep them separate in her head. On one occasion she had been given a copy of a Victorian novel which had been wrongly bound, so that a whole section came in the wrong sequence; this had been pointed out to her beforehand, but she had replied, 'Oh, it doesn't matter to me,' and had read the book straight through. Yet, she showed no essential failure on sensorial tests, and no one could have fully realized these deficits in ordinary and superficial conversation.

The relatives, with their greater opportunities for observation, are often illuminating. A husband, concerned over the fact that he could never feel satisfied that his wife had really taken in the films which she saw (for, even though he knew the plot, she

seen or books they had read, were very inadequate in conveying the pith of the matter, compared, in some instances, with what they had been able to say before, and in other instances, with the accounts which their relatives (who appeared roughly comparable in mental calibre) were able to give. For example, a highly educated woman who was an authoress as well as being a member of one of the learned professions, related how, on visiting her home after an absence, she had had to force an entry through a window: but why this had been so remained unclear in spite of questioning. Asked if her arrival had been unexpected, she said that she had been expected: asked if there had been anyone there to receive her, she said that there had not been: asked if it had been intended that there should have been someone there to receive her, she said that it had not been so intended. Asked how, in that event, it had been intended that she should get in, she answered, 'With the key.' Asked if the key had been sent to her, she said that it hadn't, and added that it had been left with a neighbour, but that she had not known that at the time. This suggested that the patient had shown some post-operative carelessness with the arrangements, but such a conclusion was quite erroneous. Inquiry of a friend who had been with her made the whole matter plain in 30 seconds. At the time of the visit the patient's housekeeper had been due to go away and had arranged to leave the key for collection from a club; at the last moment she had been prevented from doing this, but had left the key with a neighbour. As the patient was already in transit she could not be notified of this, and the housekeeper, stupidly enough, left no explanation. As the neighbour lived a mile or so away and was not personally known to the patient, there was no indication to go there, so the patient, having failed to find either the key or an explanation of its absence at the appointed place, had proceeded to her house and had been obliged to make a burglarious entry. Now, the patient had not been in the least reluctant or unco-operative over this conversation; it seemed, on the other hand, that though fully aware of the sequence of events, she was unable so to relate them as to formulate the matter intelligibly to anyone who had not been present at the time. Much the same thing was noted in 5 other patients, or 8·3% of the group.

25 years. Neither of these patients appeared in the least stupid in general conversation. In the whole group of 300 cases, at least 7 recovered patients got lost at one time and another. It was impossible to find any reason for this that was common to all. One of the patients frankly admitted that, though she had used the station on and off for years, it did not occur to her that all the trains passing through might not go to the same destination. Another said that she could not understand the directions that people gave her, so went on inspired by hope. CASE 253 said that sometimes she felt too impatient to wait for the right bus, but that at other times she had thought she was on a 3, but had found it was a 43 or a 32. This was rather surprising, but was in line with an observation of her sisters, that the patient had several times come home and had said that she had seen something in a shop for 15/- or 9/6 or 10/-, when in fact the sister found it had been £1/15/- or 19/6 or £2/10/-, and had concluded that, as part of the sum had always been right, the patient had only taken in that part of it. Some thought they had got lost through inattentiveness, but that did not seem a good enough reason for the patient who took 50 minutes to cover a 7-minute journey, though she had correct written instructions, including a map, to which she repeatedly referred. The writer's belief was that these people had a real difficulty, intellectually determined, in finding the way.

Among the patients recovered from affective disorders, there were also some difficulties in performance at work. Two took up work, to which they were unaccustomed, and which involved figures: one as a cashier, and the other as a collector of insurance money. Neither could keep the books correctly despite help and instruction. They could not remember the amounts of money involved, they entered them wrongly or forgot to enter them, and they made mistakes in the addition. Each of them lost her job. As a result one of them worked in a factory where she stuck the labels on bottles; she had previously been a demonstrator of coffee machines. The other became a telephone operator, where she was helped by having to write the numbers down, and by having had some small experience of the work before. Another patient, an ex-nursing sister, took up shorthand and typewriting when just over 30, but was unsuccessful in learning

could never explain them to him in any intelligible way), sought to clarify his doubts by asking for the original of the cowboy story of which his wife had given him a version which seemed to him quite without point. When the story was told to him, with such little point as it actually has, he was astounded at its simplicity. A wife proffered the information that her husband could nor retain multiple items in his mind. If asked to do some shopping, he could remember perhaps up to three articles, but became confused and bewildered (like nothing that she had seen in him before, and indeed he was a skilled worker) if more were added, and became quite unable to get them right; when they were going together on an expedition, he several times mentioned the destination by the wrong name, and even though repeatedly corrected he persisted in it without awareness of mistake, carrying this even to the point of asking to be put down at a place which was not on the coach route at all; on another occasion he had expressly told her to get up a few new potatoes from a special crop for lunch, and within 24 hours was very piqued that they had been interfered with as he could not remember having given any such permission. Such mistakes, she said convincingly, were quite unlike his pre-operative self. (This case, incidentally, has been recorded in the literature as being free from deficits.) A girl with a university degree was noted by her sister to have difficulty in taking in events which occurred outside the home. The patient was a reasonable performer on sensorial tests, but when asked what news she had been reading, she erroneously brought together pieces of two separate items by replying that she understood Czechoslovakia had taken over Guatemala.

Two, among this group of recovered patients, got lost. One man, when he first resumed work after a long absence, apparently changed into the wrong train on the homeward journey, and though it was quite impossible to gather the sequence of events from his account, he was missing for several hours, having made what should have been a 20-minute journey between two places on the fringe of the suburbs, via the West Central district of London. A woman, formerly a nursing sister, was unable to find her way to a grocer's in a village in which she had lived for

operation became bewildered if she had to remember more than a few items connecting certain patients with certain diets, and whether they did or did not have sugar. She was unable to compete with this, and it is noteworthy also that, despite every appearance of normality and a previous success in a routine job, she could in no way see any point in the cowboy story at 18 months after operation: her mother, seemingly a really stupid person, could see it without difficulty.

A youth, who had formerly worked in a factory and had successfully studied foreign languages in his spare time, went to work in an upholstery firm more than 12 months after operation, but found, to his own surprise, that despite intensive instruction he could not learn to stuff mattresses. He realized that this had been so, but he could not explain in what way he had failed or why he had found it difficult.

A girl who appeared fully recovered from a schizophrenic illness with affective colouring, and had been admitted to one of the Services, had done four weeks' instruction in the principles of the internal combustion engine. She was able to impart even less about this than the writer, though she had attended the classes zealously. The following was the conversation (and it may be explained that this girl had been a secretary before her illness):

Q. 'How does the engine work?'
A. 'It works by gas.'
Q. 'What's the gas?'
A. 'I don't know, it's gas.'
Q. 'What does it do?'
A. 'It goes into the cylinder, the cylinder's in the piston, and it's burnt.'
Q. 'What burns it?'
A. 'I don't know, it's inflammable.'
Q. 'What makes the flame?'
A. 'I don't know. Oh, is it the spark?'
Q. 'I believe so, and when the gas is burnt, what does it do?'
A. 'It escapes by an outlet valve.'
Q. 'Does it do anything before escaping?'
A. 'It goes out through the valve.'

the former (as were 2 other recovered patients from other groups). Another patient, of high intelligence, returned to her secretarial post, but found that she could not remember the details or sequence of matters of any complexity, though they had formerly been easily within her grasp; she was able to work successfully in a similar but less exacting post. Another patient resumed a car hire business, but showed poor judgment in several directions which indubitably led to its liquidation. A man who had run his own business for years was quite unable to keep the books for about the first 6 weeks of his return; he gradually re-learned, but according to his wife, who works with him, his accuracy in so doing is less than before and his capabilities seem less great. Finally, 3 professional people showed a great decline in their abilities, and 2 of them retired. Then, there were 7 housewives who were less effective than before, apparently through a sheer failure to plan and to grasp the relationship between their finances and their needs, apart from mere extravagance. Thus, a survey of the work situation alone shows 16 patients, more than a quarter of the sub-group we are considering, to have a reduced efficiency which is believed to be essentially due to a reduction of their intellectual abilities, as opposed to mere change in personality. In addition, there are 8 more who were considered certainly to show intellectual deficits on clinical observation, which makes a total of 24, or more than a third.

If, in addition, we consider the recovered patients from the other groups in their work situations, we find:

A girl, previously a teleprinter of ability, was able to resume this work as long as she used the same code which she had previously used; after 3 months' effort she was still lost when trying to use another.

An advertising designer, a woman of some intellectual brilliance, was able to earn upwards of £1,000 a year within 6 months of operation. But she was quite dismayed by her paucity of ideas, by the failure of one thing to evoke associations which might have led to another, over which at times she almost despaired, though she had done this work with no difficulty before. By the end of a year, it is true, she had no complaints.

A girl who worked as a nursing orderly more than a year after

who have shown somewhat similar disabilities outside their work and those who have a positive inability to interpret proverbs or who have noteworthy sensorial deficits as compared with pre-operative performance, we have a total of 54 cases with intellectual deficits out of a total of 92 recovered cases.

When one considers, further, that the collection of these instances has depended only on the chances that happened to bring such deficits to light, it would seem probable that the latter are far more widespread than would superficially appear.

Nor does it appear that such deficits are of academic importance only. Indeed, we have seen that some of them have been of consequence in the life situation. It may be said, it is true, that as far as the cases in this series were concerned, the consequences were not grave on the whole, when one considers the seriousness of the illnesses from which the patients suffered, and the gravity of their pre-operative prognoses. After all, most of the patients who recovered from their illnesses (even including those who had suffered from other than affective disorders) were able to resume their lives at much about their pre-morbid level. But one wonders how much that was so in spite of the operation, and it was certainly noticeable that, on the whole, it was those who had been in the more skilled occupations who had lost the most.

Of course, that raises the question, which will already have been in the reader's mind: Did they lose it because of intellectual deficits, or because of personality changes? Were these changes previously cited due only to alterations in attitude and feeling, or were they due to intellectual deficits *per se*? In the writer's opinion, both sets of changes contributed, and the intellectual deficits formed an essential part of the failure. But to prove that is quite another matter.

The occupations involved in the whole range of recovered patients were: solicitor, doctor, dentist, engineer, company director, advertising designer, trained nurse, physio-therapist, teacher, teacher in training, apprentice to estate agent, tea-taster, secretary, clerk, teleprinter, referee, shoe-maker, saleswoman, factory worker, railwayman, and labourer. The rest were housewives or retired people, of those of independent means.

The solicitor, having been employed by a legal firm after

Q. 'Does it push anything?'

A. 'I don't know.'

Q. 'What does the piston do?'

A. 'I don't know. The whole thing repeats itself, the same thing happens over again.'

Q. 'How does it make the car move?'

A. 'I don't know.'

Q. 'Where does the gas come from?'

A. 'Well . . . well, I don't know.'

Q. 'Where's the gas kept?'

A. (*Laughs*) 'I couldn't say.'

The extraordinary thing was that she passed an examination in this subject, after an initial referral, some months later. This conversation took place between 12 and 18 months after operation.

A partner in a building firm, quite accustomed to the work, had to have all his calculations checked, though he was diligent and spent much time upon them; he became harassed, instead of being post-operatively nonchalant, because he could not remember quite simple methods for estimating the number of bricks, etc., required, and he tried unnecessarily complicated and sometimes extraordinary means of calculation in efforts to overcome this handicap. This was still so at 2 years after operation.

A saleswoman, who formerly had been such, was quite unable to make simple monetary calculations in her head (though she could on paper), so that it seemed impossible that she could give the right change in course of her work unless she wrote it down. In fact, she said that there had been complaints because the wrong amount was always found in the till at the end of the day, and, although she said that it was the fault of the other girls, she also said that it had been against her that the complaints of the management had been specifically directed.

Numerous examples of this sort could be quoted, and if such peculiarities as those cited in the description of CASE 253 (see page 65) are part of the same phenomenon, as the writer believes, then, taking those cases who have shown deficits of the kind we have been considering in the work situation, together with those cases

teacher in training, though that they could have done so entirely is doubtful. One must certainly suppose that the intellectual changes were primarily responsible for the lowered performance of the doctors, the solicitor, the engineer, and the secretaries. If this is so, it would seem that the operation carries grave dangers for those engaged in the higher intellectual ranges of work. It may be a great mistake, therefore, to suppose that, because the intellectual deficits were of small consequence in this series as a whole, they are of small consequence in any given case. The available evidence suggests that that is not so.

But what is the evidence that the doctors, the solicitor, the engineer, and the secretaries had intellectual deficits? It rests only to a small extent on deficits in sensorial tests, though one of the doctors was far below any normal limits. But we have already said that such tests are too primitive and simple to display the deficits which we can see from clinical observation. The intellectual changes are more recondite than that, so that it is necessary to scrutinize these patients again.

There is another feature about them: their conversation is factual, restricted, and unreflective. It is less imaginative than when we knew them before, more limited in awareness, and with fewer ideas. The change is subtle, perhaps, but none the less apparent, though difficult to describe. One wonders if here, perhaps, there may not be some failure of synthesis.

'Ascertainable mental disturbances will be found only,' Goldstein (1935) has said, 'in cases of extensive lesion localized in the pre-frontal region . . .,' so that in cases of pre-frontal leucotomy, they should be observable. It is difficult to gather, however, what degree of change, and with how much variation from case to case, is to be expected. He states, it is true, that special methods of investigation may be needed to demonstrate this change from the 'abstract' to the 'concrete' attitude, so we may conclude that these changes are not always gross. Elsewhere, he lists eight points (1941) which characterize the 'abstract attitude' in a positive sense, while the 'concrete' attitude is characterized by their opposite. And he has formed conceptions of the concrete attitude, as being realistic, unreflective, concerned with apprehending things but not through the mediation of discursive reasoning, with thinking and acting which are directed by the immediate claims of one aspect of what is apprehended; and

operation, was asked to leave it. The doctors were able to keep the wolf from the brass plate, one successfully after a most uncertain start, the other precariously: the evidence was clear that they were not what once they had been. The dentist never resumed practice. The engineer returned to engineering, but shakily. The company director had much difficulty and was in a family firm. The advertising designer was exceedingly successful, after an initial period of difficulty. Of the 3 trained nurses, only 2 went back, and neither ultimately survived. The physiotherapist practically retired. The teacher had many difficulties, but they appeared mainly of a personality rather than an intellectual kind though she had marked difficulty in planning. The teacher in training had anyway found the work unsuitable, but is still a nursing orderly 2½ years after operation. The apprentice to an estate agent was stopped from the work because his employer decided that he would never gain sufficient grasp, as well as because he was unreliable. The tea-taster resumed his work and was successful. The secretaries found their tasks more difficult, with lowered powers of concentration and some awareness of diminished grasp. The clerks managed successfully provided that the duties were of routine kind. The teleprinter could work only with her original code, and several times lost herself. The referee was helped to become an assistant promoter. The others managed satisfactorily except that three patients accustomed to saleswomanship had some difficulty if there was much to cope with, and one had difficulty with the change, while several of the housewives were less efficient, prudent, and economical, but only in 3 instances to an extent which involved serious complaint.

It appeared to make no significant difference, as regards performance at work, whether these patients had recovered from affective disorders or from schizophrenic conditions of various kinds, or from obsessional states. There seemed to be no reason why these patients, even those in the skilled occupations, should not have fully succeeded apart from their personality and intellectual changes. But the former by no means always adequately accounted for the failure. They might have accounted for that of the dentist, the trained nurses, the physio-therapist, and the

the patients have been so tested, and with negative result. In others, it has been clear without testing that some of the changes that Goldstein has described have not taken place. For instance, while it is true that some of the patients do have to do sums in the air, though they did not before, make use of the fingers in calculating, write with a forefinger on the sofa cushions, others have told lively anecdotes in which there has been vivid use of pantomime, pushing about imaginary furniture, tapping imaginary typewriter keys, etc. Other patients have not only drawn maps, but have had the foresight to send them unsolicited showing the way to the house, or have for themselves anticipated one's needs by giving complex and accurate verbal directions over the telephone.

These changes, therefore, are not invariably present nor always gross. Yet, we do get frequent hints, and more than that, of just what Goldstein has described. The difficulty in reversal of digits is presumably related to points 4 and 5 in Goldstein's list, while points 2 and 4 are exemplified in the difficulty, already referred to, shown by many patients in grasping the concept that they are required to reverse the digits, not merely to repeat them forwards. Point 7 might account for the difficulty in doing subtraction sums in the abstract, and the failure of planning in point 8 we have seen more than once.

Can we discern these trends from the abstract to the concrete in these particular patients, the doctors, the solicitor, the engineer, and the secretaries? In the secretaries we can, for both have observed that they cannot grasp and retain multiple items, that they can remember some details of a whole but not others, and that as soon as any complexity is reached they are in difficulties, though such things were well within their grasp before. We have also quoted already an instance of failure in synthesis of one of the doctors, which came our way by chance, when she was unable to relate the sequence of events to each other so as to present an intelligible formulation of why she had to make a forcible entry into her house (page 62). This leaves us with the other doctor, the solicitor, and the engineer.

Scrutiny of the notes shows that one of these was visited in a country place to which he was new, but had been there for

of the abstract attitude as being more active, implying reasoning, self-awareness, the ability to select common from particular properties, and to reach a conceptual viewpoint, so that whatever is apprehended appears as a member of some category or class. These attitudes, Goldstein claims, show themselves in the life situation in such ways as these: (1) the patient who has lost the power of abstract attitude cannot detach himself either from the outer world or from inner experiences: so that when asked to use an eating utensil, he cannot do this in pantomime, but only when eating: asked to say, 'The snow is black,' will repeatedly answer, 'The snow is white,' and if paralysed in the right arm, will be unable to say, 'I can write well with my right hand,' but will always substitute the word 'left' for 'right.' (2) And he cannot assume a mental set, so that he cannot initiate action on his own, and if he has been started off and interrupted, he cannot resume without help. (3) He cannot give a meaningful account of his acts in verbal form. (4) He cannot shift reflectively from one aspect of a matter to another, so that though he can relate the series of numbers from one onwards, he cannot, when asked, start at a particular number other than one; and if the examiner shifts from one topic of talk to another, the patient cannot follow. (5) He cannot hold various aspects of a matter in mind simultaneously. (6) He cannot isolate parts of a whole and synthesize them, nor grasp the essential of a given whole. (7) He cannot isolate common properties of things on reflection, nor form 'hierarchic concepts'; e g. he fails on tests with simple syllogisms, or on tests of finding the common denominator of various items (such as placing all objects coloured green in one category), and while able to add and subtract he has to do this on his fingers, and then is unable to state in the abstract what is the value of different numbers or if 7 is more or less than 4. (8) He cannot plan abstractedly by the ordinary means of thinking and acting symbolically, so that, though he can find his way about, he cannot draw a map or give a verbal account of his route, nor can he 'assume an attitude towards the mere possible,' so that he cannot demonstrate how to use a key when he is asked to open an imaginary door.

Now, all the patients whom we are considering have not been tested specifically in all these ways, and it is impossible to say precisely to what extent these changes have occurred. Certainly, after pre-frontal leucotomy they do not always occur, for some of

a name and an address to remember. . . .' At once, he picked up a pencil and began to write them on the blotting pad. When told, 'No, no, I want you to try to remember them,' he replied, 'Oh, it's quite all right, I think, it won't mean anything to anyone here, I expect.' And that seemed odd, for, though he had been in the office for 6 months, he seemed to be confusing the confidences of professional practice with a memory test which he had done twice before. This, too, seemed suggestive of point 6.

Whatever the facts of the matter, there is something about these little oddities which, to the writer, seems significant. Whether they represent traces of a failure in synthesis or not, they suggest abnormalities in the thinking, though it is a matter of opinion and cannot be proved.

There is the further puzzling fact that, as will surely be agreed, some of these deficits are quite gross, while some patients seem to have no discernible intellectual changes at all. Those that have been noted may be due, of course, to accidental damage, but at the same time, when such deficits can be observed by such haphazard methods, and in more than half the cases, it would seem likely that, if tests were available that would show them, they would be found in many more. It is, at any rate, the writer's conclusion that this operation, as at present performed, is conducive to the development of intellectual deficits: that these may be fatal to the performance of work that demands originality and synthesis of ideas with attention to much in the way of simultaneous detail: that as regards the living of a social life and the performance of routine duties, they may constitute no appreciable handicap at all, while in an uncertain number of cases, probably small, the patient appears to be without deficits in the intellectual sphere. Since, however, these vary from an obvious to an elusive (but still potentially important) kind, it is impossible to say that they do not occur.

Summary

(1) No tests were carried out of a kind adequate to reveal whatever intellectual deficits there may be following prefrontal leucotomy.

several months. It was noted as surprising that he knew nothing of the attitudes of the local people whom he met daily; he did not know how they voted nor who was the member of parliament nor of what party; he did not know if there were any local industries or crafts; he did not know the region to which the place belonged for allocation of petrol; he did not know the early closing day. He had hardly anything to say spontaneously, though he readily followed a lead. It was known also that he sat much of the time unoccupied. This might have been due to mere lack of interest, but on the face of things that did not seem likely. Might it not have been Goldstein's point 2, an inability to assume a mental set, so that he could not initiate activity on his own? When seen a year after that, and 2 years after operation, he was about to go somewhere next day to stay for a while; he was interested in and excited about it; he had written several letters there, he had that day looked up the train service; he had also looked the place up on the map, and had found it, only a quarter of an hour before. Yet he could not remember its name. 'It doesn't matter,' he said, 'I've got it written down,' and he brought a piece of paper from his pocket. That seems suggestive of some intellectual deficit.

One seemed entirely well, and said in a slightly self-important way that he had many ideas for local improvements. This was interesting, as a change from the usual post-operative conversation. But when interrogated he became evasive, and when pressed he produced two suggestions. One was for the provision, for small purpose but at great expense, of huge strips of concrete by people who could not possibly have afforded to pay for it; the other was the pale ghost of an idea, without the least practical detail, that a machine might be made to do something then done by hand. That a once brilliant man should say such things with such an air seemed also odd, and faintly suggestive of Goldstein's point 6.

The other looked quite professional in his office, seated behind a desk littered with documents. In his conversation there was no obvious or gross abnormality. But during the sensorial tests, of which—it should be noted—he had had two previous experiences, he was told, as he had been told before, 'I am going to give you

(11) The tendency is for these trends to be increased rather than to be diminished by the accompanying personality changes.
(12) There is a tendency for the more gross deficits to be overcome with the passing of time.
(13) It is impossible for the writer to accept the view, advanced by some psychologists, that intelligence is unaffected by this operation. It would appear that the tests at present used are not sufficiently refined.

(2) The writer is in no doubt, however, that intellectual deficits do occur, though he can prove it in only a small number of cases.

(3) On simple sensorial tests the only deficit general to the patients as a whole was found to be on reversal of digits.

(4) There were, however, features suggestive of a tendency to the development of other deficits in a number of cases even on such simple tests.

(5) Viewing the patients' behaviour in the life situation as a whole, it was concluded that there were intellectual deficits in more than half the cases.

(6) Considering that most of these observations depended more rather than less on chance, it is probable that they existed in many more.

(7) Some of the deficits were gross, but some were elusive; though traces of altered thinking could be seen in the latter, their full significance is not understood.

(8) While the deficits were not of such an order as to constitute a handicap in ordinary social life or in routine work, there is suggestive evidence that they might be fatal to the performance of work demanding originality, synthesis of ideas, adroit distribution of attention, and grasp of simultaneous details.

(9) While the presence of such deficits was not incompatible with earning a living by skilled work, it may be hazarded, though not proved in any way by the available facts, that such would demand having had some familiarity with it before.

(10) The deficits consist of a tendency to less ready orientation in time than in other spheres, to diminished power of rapidly alternating the attention, to more primitive thinking shown by some difficulty in holding several items in mind at the same time, in attending to their various aspects, and in grasping and formulating their relationships, with consequently diminished ability to synthesize ideas into concepts; there is also, and probably secondary to these, an increased carelessness with tolerance of mistakes, and a tendency for thinking to be concerned with the factual rather than the abstract.

negligible. Further, each post-operative change may influence the others. For example, a person always poorly controlled may, if post-operatively inert and with blunted affect, neither feel so keenly nor express himself so vehemently, and thus may even present the appearance of being more restrained until some specially provocative situation arises. Contrariwise, a patient with reduced post-operative spontaneity and affect may give an appearance of increased vivacity, if lack of restraint allows him to talk garrulously and with ample gesture, where previously a greater complexity of feeling had led to inhibition. In this way, one change may offset another so that not only the extent of the changes themselves, but the extent to which they interplay with one another, may lead to great variations in the total post-operative picture. And when one considers in what protean fashion the pre-operative personality characteristics may colour the post-operative condition, it is clear that no statement can be prepared which will afford an accurate and at the same time general description of the post-leucotomy state as a whole.

Attempts to do so have certainly led to a bewildering variety of contradictions in the literature. Such seemingly contrasting traits as obstinacy and pliancy, distractibility and inability to shift attention, placidity and irritability, egocentricity and extraversion, aggressiveness and submissive desire to please, have all been mentioned at one time or another as characteristic of the post-operative state, and different emphasis has been laid upon each by different observers.

It is none the less desirable, despite these difficulties, that we should have some general idea about the post-leucotomy state, not only in order that we may be able the better to understand it, but also in order that we may be able to make some prediction as to the probable personality changes to be expected after operation in any individual case. In this connection the difficulties that prevent one from making any accurate generalization about the post-leucotomy state need not lead us to suppose that we are entirely without general rules for our guidance. On the contrary, it appears that by studying the basic changes in the patients and the interplay between them, we can arrive at certain basic concepts which will give us some idea of what, post-operatively, we are entitled to expect in the way of

THE POST-OPERATIVE PERSONALITY AS A WHOLE

We have so far considered changes in the post-operative personality under four headings: changes in activity, in affect, in restraint, and in intellect. It has already been stressed that an itemized concept of this kind is artificial, and has been used only for convenience in approach. In order to try to understand the changes that may appear in the post-operative personality as a whole, it is necessary to consider them not as items in themselves, but in relation to each other. Any attempt at describing the post-leucotomy state as a whole, however, is fraught with difficulty, and this is so for many reasons, of which the chief is that one is not viewing a condition that is static, but one that is constantly changing. We have already noted that patients may be capable of concealing their post-operative changes when it suits them to do so, and to an extent which, when they are not tired, may be quite deceptive to the unwary observer. Such are, therefore, in no sense absolute changes; they are merely trends, and they vary much not only from one patient to another, but in the same patient at different times. Further, it is not the case that as soon as the operation is done the post-operative condition of the patient is at once and permanently established. On the contrary, as we have already seen, the patients may deteriorate or improve, though the latter is more usual, and it appears that they continue to make adjustments not only for months but even for years after operation, so that no one can yet be sure if any limit of time is reached beyond which further improvement cannot be expected.

This dynamic state of affairs is enough in itself to make any accurate general description of the post-operative state impossible. But there are other difficulties also. The changes themselves occur to very varying extents. Some patients may lose much, and some little, in activity, affect, and restraint; and while the changes in affect and activity tend to run parallel, those in restraint are more independent. In some patients, again, the intellectual changes may be notable while in others they appear

the patients—to a greater or less extent—post-operatively lack restraint. We have seen that this shows itself in such ways as outspokenness, the ready expression of irritability, and a tendency to act without considered thought.

Our third concept, which we have also already noted, and which is bound up with the foregoing, is that the total personality changes are influenced in some degree by the intellectual changes. These last, as has already been said, may be marked or may be unobtrusive. In some cases their influence on the post-operative state is unmistakable. Even where it is not, some subtle intellectual change with effect on the total personality can often be discerned. And even where no such effects are directly observable at all, it is still possible that such changes are exerting an effect on the post-operative state in an insidious fashion which has eluded recognition; for, just as we cannot define these intellectual changes with precision, though we get hints often enough that they are there, so we cannot be sure that they do not exert effects equally elusive of definition. They may contribute markedly, if not obviously, to changes in feeling and restraint, to changes in interest and self-expression, and through those to alterations in the post-operative personality as a whole.

Our fourth concept is that these are not absolute changes, but are trends, which become apparent or are in abeyance according to the varying demands of varying situations, in course of which, through mutual interplay, the effects of one may be such as to offset or to enhance the effects of another. We have already considered such a simple example as when a pre-operatively irritable patient gives a post-operative appearance of being more restrained because the reduction of affect and activity has led to a diminished sensitiveness as well as to less vigorous self-expression; but, though that may be the prevailing picture, the lessened restraint may become obvious in the form of a far less controlled irritability than ever appeared before, should circumstances arise of specially provocative kind. An interesting example of this is shown by CASE 26, page 127, who relapsed post-operatively into hypomania; the hypomanic state was much milder than any such that had gone before in that there was less push of talk, less excitement, and less activity; yet there was less restraint in that the patient used bad language and coarse expres-

general trends of personality change, and which, though they may not lead us to any accurate generalization, may yet be helpful in predicting the outcome in an individual case.

The first concept is that we have observed that these patients are on the whole post-operatively less 'keyed up.' This shows itself by a reduction of 'tension,' and is apparent at the psychic level in a shift from uneasiness towards placidity, and in behaviour in a shift from activity towards inertia. 'It isn't worth worrying,' the patients say again and again, though pre-operatively they may have worried incessantly. Where previously worry would have implied activity and effort, now the absence of worry implies inertia and acceptance. This, among these patients, is an observable general trend. We have noted, in our considerations of post-operative activity, the tendencies to get up late, to go to bed early, to sit about unoccupied. Even in those cases which have appeared normally active, there has been a tendency, not previously present, to take brief rests, to fail in sustained attention, or to experience undue fatigue. In the whole series of 300 cases, there were only 3 in whom this trend was not easily discernible. In 1 of those 3 (CASE 33, page 132) there was an almost pathological diligence in gardening; but investigation showed that this was pursued, despite feelings of disinclination and inertia, merely as the lesser of two evils, and because it allowed the patient to be on his own and out of the house. In the second (CASE 213, page 260) there was pathological restlessness sufficient to arouse speculation as to whether it could be the result of accidental damage (perhaps bilaterally to area 13), but even this was punctuated by frequent rests, and retirement between half-past 7 and 8 in the evening with complaints of undue fatigue. Thus, neither of these cases was a real exception to the rule, and there was only 1 of the 300 patients, in fact, who failed to show a reduction below her normal pre-morbid activity. We have noted also the correlate of this in the affective sphere, varying from a marked emotional blunting to a mere tendency to worry less. It is as though not only the activity but also the emotions that prompt it are reduced. The two together give the post-operative appearance of what we have described as a 'lowered drive.'

Our second concept, which we have also already noted, is that

cated intellectual and affective processes which lead to the expression of a tactful sympathy, the patient is the more likely to say straight out what he has in mind, regardless of its possible effect; and the intellectual changes may thus augment the effects of the lessened affect and restraint. Conversely, a pre-operatively irascible and aggressive person post-operatively confronted with a subtle sarcasm may fail to appreciate it, and so, despite diminished restraint, may not respond where he might have responded energetically before. Innumerable examples might be cited, but these few suffice to show how the post-operative changes may, according to circumstances, offset or enhance each other, so that the resultants, changing and wavering like images in water, depend on the tide of events and the influences of the moment.

We have, none the less, four basic concepts hitherto: namely, that the patients show post-operatively a lowered drive, a tendency to lessened restraint, a tendency to intellectual change which makes for simpler and more primitive modes of thinking, and, fourthly, that these various trends may be concealed or revealed according to the demands of the situation, but always exist as trends although they may combine in various ways to offset or to enhance each other.

To these we must add a fifth concept, which, so far from being an added complexity which might cause dismay, on the other hand lends definition and therefore makes for simplicity in our picture of the post-operative state as a whole. This is, that all these changes take place within the framework of the previous personality, the traces of which—and more than the traces—can be seen post-operatively to persist, albeit often with modification. But it would certainly seem that, as a general rule, the extent to which the post-operative changes develop depends on what the previous personality was like. To say this is not to put forward a neat and exact theorem; but it is to state a broad, general trend. The patient who has always been slow, sluggish, and dull is the patient who after operation is lethargic and apathetic. The patient who has always had a high endowment of energy is not post-operatively reduced to the status of a vegetable. It cannot be said that the patients who fall between these extremes emerge after operation in exact order of precedence as regards their display of energetic activity; but a patient who has shown

sions, was rude when vexed, and relaxed her standards of 'ladylike' behaviour (by which she had set great store) in a fashion which she had never shown in any pre-operative attack. It is through an interplay of this kind between the lowered drive and the lessened restraint that the patient may post-operatively show both a greater irritability and a greater placidity than he ever showed before; but, of course, he will not show them both at once. In the same way the lowered drive, which does not conduce to effort, may incline the patient to take the line of least resistance, and so give an appearance of pliancy and docility; but should his displeasure be aroused, his lack of sensitiveness and his lowered restraint may combine to produce an obstinacy of the most intransigent kind, and so after operation he may be both more docile and yet more obstinate than he ever was before; but again he will not be both at once. Likewise, if affect be much reduced, and with it the tendency to worry, a patient whose worrying attentions have pre-operatively been turned towards himself, may post-operatively be freed from them to an extent which allows him to attend with pleasure to things outside himself and so to be *more* extraverted; but at the same time a *diminished* affect may cause a lack of sensitiveness not only to his own cares, but also to those of others, and thus while more extraverted he may, in his pleasurable pursuit of outside things, be more egocentric; and these changes of attitude may co-exist together. The intellectual changes also, according to circumstances, may enhance or diminish these effects. For example, a patient whose interests have been mainly intellectual, and whose drive has been mainly directed towards such ends, may find post-operatively that his simpler modes of thought (arising from difficulties in forming concepts and in keeping various aspects of an idea simultaneously in mind) prevent the attainment of the intellectual pleasures that he enjoyed before; he may not respond then to stimuli that were previously enlivening, so that, in the absence of other interests, the post-operative effect upon him of the lowered drive may be enhanced. On the other hand, such a patient, if sharply criticized, may be unable to achieve those complex concepts which might formerly have led him to excuse his critic, and so may respond in lively and primitive fashion where there might have been no response before. Likewise, if there is impairment of those compli-

was pre-operatively curbed by morbid feelings of inadequacy or extreme fears of disapproval. This is a further illustration of what we have noted already, that these post-operative changes which we have itemized for convenience are really inseparable from, and interplay with, one another; for, in such an instance as we have just considered, it was pre-operatively an excess of affect that led to the restraint and caused it, while post-operatively the reduction of the restraint was attributable, in part at least, to the reduction of that affect; where, on the other hand, the pre-operative restraint was attributable to good reason rather than to affective excess, the post-operative reduction in affect will, as would be expected, reduce the restraint but little. In fact, the essence of the previous personality remains, though its dynamics may be altered by removal of neurotic symptoms.

Those, then, are our five basic concepts in considering the post-leucotomy state. There is a lowered drive, there is a reduction in restraint, there are intellectual changes characterized by a tendency to less complexity in mentation; there is an interplay between the lowered drive, the lessened restraint, and the intellectual changes, which reciprocally influence each other in a dynamic way and according to circumstances, sometimes with the effect of making the post-operative changes more obvious, sometimes with the effect of making them less so; and finally, all these changes take place within the framework of the previous personality, the essence of which remains and which is discernible despite the modifications imposed by the lowered drive, the lessened restraint, the simpler mentation, and theinterplay between them.

After these somewhat academic considerations, it remains to consider the post-leucotomy state against the background of the life situation. How do these patients get on?

It may be said at once that almost all of them are happier, though the question may remain whether this is necessarily a change for the better. 'Thou would'st be joyous, would'st thou?' cried George Borrow, in an over-rhetorical moment, 'Then be a fool. Who were the great ones, the wise ones, the conquering ones of the earth? Were they the joyous? I believe it not.' The matter may be put in some perspective by saying that, though 'joyous' is rather too vivid a word to apply to them, the leucotom-

reasonable activity before operation is likely to show reasonable activity after it. It is true that the most highly energetic patients may, in a sense, have lost proportionately more than the pre-operatively inert ones, but they are yet more likely to achieve a satisfactory functional result. Similarly, those patients who have always been vivacious and with a high affective charge will, after operation, regain a greater measure of vivacity than will be attained by those who are naturally more phlegmatic. The extent, however, to which restraint will be post-operatively regained, or retained, is less easy to anticipate, and any accurate prediction requires a very thorough knowledge of the patient. When, as occasionally happens, the upset that operation may cause in the dynamics of the pre-operative personality leads to the post-operative emergence of a person surprisingly different, such difference seems to lie more in the field of restraint than elsewhere. In such cases, changes in fineness of perception and delicacy of feeling are, of course, involved as well as changes in restraint, but the latter are the most obvious and striking when, for instance, a previously timid and mouse-like patient becomes post-operatively self-assertive and outspoken. What he says, and the revelation of what he thinks, may be positively startling to the family, especially if they have been unperceptive people. But it will be found that in fact the patient thinks what he thought before; the difference is that he did not formerly express it. The extent to which such change occurs appears to depend on the extent to which such pre-operative hesitancy in self-expression was controlled by reasonable choice on the one hand, or by psychopathological factors such as obsessive doubts or neurotic fears on the other. The more that the pre-operative restraint was attributable to reasonable choice, the less is it likely to be post-operatively reduced; the more that it was attributable to such neurotic mechanisms as emotional or inhibitory excesses, the more is it likely to be post-operatively reduced. Thus, a member of a family who has always hated some other member of the family is almost certain to be post-operatively outspoken in expressing such antagonism, even though he may have concealed it before. But the patient whose pre-operative restraint was the product of reason and good sense will post-operatively retain restraint to a greater extent than will he whose self-expression

determined largely by the likes and dislikes of varying individuals, which themselves vary both in direction and intensity at different times and in different circumstances.

Thus, the patient who has always taken things easily, and who has not been readily put out by disappointments and dislocation of affairs, is likely post-operatively to take things more easily still. On the other hand, a patient who has always been meticulous and who has resented interruptions of his routine, may find that his post-operative inertia makes it even more difficult for him to adjust to sudden changes, which may stimulate him to a pettish annoyance which he would have restrained before. But, whether or not the patient is put out by sudden changes (and his reaction is likely to be determined by his previous attitudes), the tendency of the inertia is to encourage procrastination. And, as with other people but here more obviously, essentially those things are put off which the patient does not wish to do. We have already noted, in considering the patients' activity, how selective may be the influence of their inertia: 'I've noticed that she's quicker when she wants to go out'; 'She has two speeds, one for doing what she wants to do, and the other for what she doesn't.' The same selectiveness is, of course, apparent as regards procrastination. For example, 'He won't do anything,' said a sister-in-law. 'The gas man, the telephone man, and the electricity people, they all came and said they'd cut it off because he wouldn't pay the rates. He won't do a thing.' But she exaggerated; he had been most diligent in writing for the prospectuses of more than 30 hotels to choose one for his summer holiday. A wife, harassed by legal affairs which both she and the patient found vexacious, said: 'It's extremely difficult to get him to discuss anything seriously. Naturally, I've avoided any undue worries, but occasionally it is necessary. It seems as if there was a weak connection in his brain. Once the connection is made he discusses anything in the clearest and most intelligent way and has a fund of common sense and judgment which astounds me. His brain is just lazy.' And he would talk of all sorts of other things without hesitation.

Post-operatively, therefore, the trend towards indolence and inertia is punctuated by activity and effort in accord with what is a very usual motive—namely, the search for satisfaction and the avoidance of discomfort—but the avoidance of discomfort is the

ized tend to show a certain placidity which rather sets them apart both from the 'great ones, the wise ones, the conquering ones,' and from that atmosphere of high spiritual values, strife and determination, contained in Borrow's challenging phrase. The post-leucotomy state is not keyed up to that; yet it does not necessarily imply foolishness or unwisdom. It is recorded of a famous French politician that on one occasion he wept twice in a day: on reading the parting of Hector and Andromache in the morning, and on reading Newton's third law of motion in the evening. The post-leucotomy state is not compatible with that; yet it does not imply a loss of all aesthetic sense. Many patients, for instance, resume aesthetic pursuits; many play musical instruments not merely better than they did while they were ill, but as well as they had done before the illness started. Yet, taking the cases all in all, one is left with the distinct impression that the edge has been taken off their keenness, and that something comparable has happened to their sensitiveness of perception, their delicacy of feeling, and the penetration and intricacy of their intellectual processes. Such reduction, however, is perfectly compatible with a successful functional result, and often represents a degree of improvement that is quite extraordinary when compared with the pre-operative condition. The fact that post-operatively they may not be among the great ones, the wise ones, or the conquering ones of the earth, and that they may fail to respond to aesthetic experiences with transports of emotion, must be weighed against the pre-operative state and the prognosis in absence of operation.

Where there is a lowered drive, with less vitality and animation, and consequently less tendency to bother, there is likely to be less concern with duty (especially if it be of an irksome kind), less need for anxious self-questioning, and less tendency to abstract speculation or remote inquiries. After leucotomy this is the rule. There is an easier attitude, with an absence of striving in favour of an uncritical acceptance, and with a preference for attending to immediate needs rather than for forming any policy of a long term kind. The whole pattern of life becomes simpler, and, in fact, the pleasure-pain principle emerges in its most naïve form. It is for this reason, to a considerable extent, that post-leucotomy behaviour fails to conform to any standard pattern; for it is

being made to dominate them unduly), they tolerate others with an equally uncritical acceptance. 'He is very happy,' said one relative, 'meeting all people, deadly or otherwise, of either sex or any age. How I envy him.' It is, on the whole, a remark that presents the general state of affairs well enough, though, just as the patients find little to criticize in their associates, so they find little that arouses any sympathetic warmth. They do not, therefore, go out of their way to seek company unless encouraged to do so, and they seldom make new friends.

The extent to which this comparative insensitiveness, with its many negative qualities, is vexacious depends on the sensitiveness of the relatives. It hardly ever troubles the patient, and as a rule it is only the family that may find it irksome.

Thus, a highly-cultivated woman, who had recovered but had been bereaved after her operation, made some conventional expressions of regret over the death of her husband. It is true that she had become somewhat tired of him, and that he had treated her with great patience and goodness did not alter the fact that she had found him boring. Though this inevitably coloured her view of his death, she seemed to try hard to say something suitable about it. Yet, in describing the sequence of events (in the supervision of which she had been perfectly efficient), she could do no better than: '... it was on the thirteenth. It always was an unlucky day for me, and it was such bad luck on him, poor dear, he'd had all his teeth out only a short while before.' Such a remark might have aroused little comment had it come from a person with neither education nor social graces. But coming from this patient, previous observation of whom (before and after operation) had yielded no tangible evidence of personality change, it was sufficiently startling to warrant an inquiry from other relatives. These had no doubt (though the husband had not noticed it) that she was affectively shallower; they were of opinion that her illness had hastened the husband's end, and were vexed that the patient should seem quite oblivious of it. 'She treated that poor man's death,' said her father, 'with a... well, really, with a levity that made me quite angry with her.' Yet, as far as action was concerned, the patient had dealt with the whole situation in a responsible and effectual way.

Less sensitive relatives might have found no cause for concern.

The tendency to indolence with its correlate of carelessness and insensitiveness to the feelings of others, may of course have more

more powerful influence, and the satisfaction must be tangible and near at hand.

The post-operative personality in the home

Such an attitude leads inevitably, and in the same way, to a selective carelessness. Thus, an over-scrupulous housewife, freed from the bondage of neurotic anxiety, may come to tolerate dust and cobwebs, but, if gastronomically inclined, she will still be fussy about the standards of the cook. Of a man who had always been fond of driving, but whose over-careful maintenance of the car had been determined by neurotic anxiety rather than interest, his wife said: 'He used to put oil in the car every time he went out. Now he doesn't put any in at all.' The carelessness appears in many forms. Many patients lose things light-heartedly; one, vexed by rationing, lost all the family ration books, nor showed the least concern. But important things are not lost as a rule. Many are careless in opinions, and in expression of them, so that their concepts are not only loose, but are incorrectly phrased: 'Oh, we had lots of fracassees . . .,' said one patient, describing some domestic quarrels; 'I read a great deal of friction,' said another, and used the word repeatedly. Innumerable examples could be given.

The carelessness implies lack of criticism, especially of themselves, and encourages the development of insensitiveness with neglect of social niceties. 'I'm not sure I like really knowing people,' said Lady Mickleham, 'It means that they say whatever they like to you, and don't get up out of your favourite chair when you come in.' We can feel sure that had his attentiveness been reduced by leucotomy, she would have been much less fond of Mr. Carter. The insensitiveness shows itself principally in an attitude which may be described in a sister's phrase: 'He just takes everything for granted.' And a father said of his son: 'He never gives you a bouquet.' Thus, kindnesses and special attentions tend not to be met with recognition. But, though that is so, the patients are as a rule no more exacting towards other people than they are towards themselves. Indeed, unless they are by nature specially aggressive, or unless they are surrounded by those who specially arouse their antagonisms (as when there have been long-standing family feuds, or they feel that efforts are

and pleasant; in situations which aroused old patterns of behaviour she was insufferable. But the patterns had been there before.

Likewise, a middle-aged woman subject to recurrent attacks of depression of the type usually considered to be endogenous, had led a life which she felt to have been entirely frustrated by a charming but dominant mother. Some opposition to her marriage had been followed by the death of her fiancé many years before; a good deal of ill health, in which both organic and psychic factors had played a part, had interfered with her working career; her dominant mother, under the guise of solicitude, had used this to keep the patient at home, where she had remained. She was unemancipated and resentful, jealous of her sisters-in-law, their freedom and their children, secretly hostile to her mother, and oppressed by feelings of frustration and a wasted life. The prominence in her mind of this theme was admirably shown in notes of previous admissions to other hospitals, but for some time before operation it had become obscured by dozens of other more or less florid symptoms which stemmed only indirectly from and had become substituted for it. After operation the patient lost her symptoms and recovered from her depression. In hospital she was agreeable and charming; on holiday the outside observer could notice in her no abnormality. It was, therefore, rather disconcerting to learn that at home her behaviour was impossible. She was rude to her sisters-in-law and encouraged their children, whom she teased maliciously, to be the same. She showed not the least gratitude to the family for their financial sacrifices on her behalf, but merely said that now she was well she was going to live as she pleased. She had always hated housework, and now she sat about for a great part of the day and refused to do a hand's turn. One afternoon she was obliged to get out of her armchair to get herself a cup of tea, for her brother had said that if she wouldn't help them they wouldn't help her; he [illegible] o fill her chair with some [illegible] on the hearth; there was [illegible] urning to it, on the very edge of the chair, and this she continued to do for the rest of the evening, partly no doubt because indolence deterred her from replacing the heavy logs, but partly also through a childish refusal to acknowledge that her brother's manoeuvre had caused her inconvenience. She refused to fit in with the household routine, expected her (very old) mother to cook her meals, and resented the slightest suggestion of authority. To her mother she was sarcastic, hostile, and rude, and when the old lady was confined to bed for 10 days

positive effects. The patient may be not only insensitive but selfish in active fashion. Greed may make its appearance, with disregard of fair shares in rationing. Old patients may be tyrannical in their assertiveness; younger ones may try to be if opposed by those to whom they have felt long-standing, if secret, antagonism. Then, the effect on family life may be quite disrupting. Old grievances, though less keenly felt, may be aired on small provocation. Nagging, cruel teasing, and complete heartlessness may be shown. On provocation, there may be furious outbursts, though—as has already been said—violence is surprisingly rare. But in none of the situations in which such events were encountered was the patient entirely to blame. It was always the fact that unwise handling, the injudicious revival at the wrong moment of some old controversy, unreasonable attempts to dominate, contemptuous references to insanity, and other things of that sort, had played a substantial part in the development of unharmonious relationships. Indeed, one could go further and say that the unharmonious relationships had been there always, but had been exacerbated by tactless handling. The point is of importance, for it shows that the operation does not give rise, *de novo*, to intolerable behaviour.

Thus, a patient who had been presented by her husband and daughter in the light of a 'dear old lady,' proved most tiresome after operation. Then, as the relatives wanted sympathy more and more, more and more of the previous story was revealed. She had been always an empty-headed tittle-tattler, slanderously malicious, ill-tempered, mean, selfish, and domineering. She was chronically dissatisfied, jealous, and had had a good deal to put up with from her husband, though he, it is true, had had much to put up with from her. There was a chronic antagonism between them. 'I believe,' he declared some two years after operation, 'she is the most exasperating woman that ever lived. She always was like this, but now everything's become exaggerated.' But it is noteworthy that after several months' residence in a convalescent home, largely due to the husband's efforts to postpone her return, the Matron could describe no abnormality in the patient beyond an occasional and transient pettishness, and said: 'We've had a lot of leucotomies, and some of them have been very good, but she's the best we've had.' It is clear that her post-operative state was largely determined by her environment; when seen by the writer she was at all times amiable

such home lives that the post-operative pliancy, which is more usual, is replaced by intransigent obstinacy, and that the prevailing placidity is punctuated by expressions of irritable hostility. Away from home, however, or when interviewed by neutral people, the patients may show virtually no abnormality at all. Perhaps, in the whole series, the worst that happened was this.

A hysterical psychopath found herself chained for life to an unsympathetic mother towards whom she had long entertained death wishes. The mother, an excellent witness, did not know this, and she said: 'She complains I don't talk to her, but if I do, it's wrong. If we listen to the wireless, it's wrong. I just can't speak to her without nag, nag, nag. If I say, "You might do so and so to save me going downstairs," she'll grumble. She'll sit here and say the whole place gets on her nerves. It's not a very comfortable home, I know. But all she wants to do is sit down and mope about. It doesn't matter who comes up here, she'll generally have a row with them all. You never saw her lose her temper before. About 3 weeks ago she answered me like I never have been answered, and I've brought up 15 children, and I turned on her with this jug and she did turn on me then, scratched my arm all the way up, she did. She used to be so fond of me. If she thought Sanatogen'd do me good, she'd spend a guinea on that, or Wincarnis, anything like that. Now, I think she'd like to do away with me, I do. I think she'd like to murder me. Before she had this operation, she didn't get angry, but all of a sudden she'd start screaming, she'd bang her head against the wall. Perhaps she'd be sitting down there, and then suddenly up she'd get, may be to the lavatory and knock her head against the wall in there. Person next door said he thought she'd broke her head one day, often thought she'd bring the wall down. Well, I got so used to it, I didn't take as much notice as I do of her hatefulness now. She'd have her screaming bouts about twice a day, but in between she'd be sweet enough. Then, all of a sudden she'd put on her clothes, and she'd be off to suicide. No, of course she wouldn't try it. She used to get up and go to the window, and say she'd jump out. What did I say? I used to say, "Go on, my girl, if you've got the pluck, but I'm not coming down no eight flights of stairs after you with a bucket and shovel. . . ." '

She was an astute clinician. The picture is excellently drawn, and gives the pre- and post-operative contrast in microcosm. Preoperatively the accesses of despair with poor control, histrionics, and suicidal threats, between which there were successful efforts (with

with bronchitis and a high temperature, the patient not only wouldn't bother to cross the landing to visit the bedroom, but never once made an inquiry as to how she was. Any astonishment that might have been felt at this behaviour was, however, considerably reduced when one saw the patient in the family situation. Her brothers were nice people, but irritable and nervous, who overreacted to anything in the patient that they did not like. They were openly far fonder of their mother than they were of the patient, whom they treated with an unintentional but offensive patronage in which there was the constant implication: 'We've spent all this money to get you well so that you can look after mother, and you've got to be grateful.' The patient more rather than less rightly felt that the illnesses had not been her own fault, and, to do her justice, would probably have put up with much less expensive forms of treatment, while the very fact that she was frequently made to feel under an obligation reduced her sense of gratitude. As she had all her life unsuccessfully tried to get away from her mother, she was irritated by the automatic supposition that she must now look after her in return for the payment of her hospital expenses, and she rebelled against these attitudes. Now, the mother was a very charming old lady, but when one had the opportunity of observing a few clashes between her and her daughter in the home, it was perfectly plain that she treated the patient as being 15 instead of, as was the case, 56; she constantly found fault, exhorted, warned, reminded, and advised her in one way or another, so that it was clearly impossible for the patient to have any life of her own except one of rebellious exasperation. It seemed indeed remarkable that she had been able to put up with it as well as she had before operation and for as long; and it seemed impossible that after operation, with reduced sensitiveness and restraint, she could react much differently from the way in which she did. The patient's personality had always been of poor calibre; its jealousy, resentment, and hostility remained, so that now shorn of her pre-operative morbid fears, obsessive doubts, and feelings of inadequacy, which had caused her to be dependent, hesitant, and submissive, she expressed without fear or hesitation and in primitive form what had been within her for years.

Disregarding for the moment which may be the cause and which the effect, we may say that personalities of this kind are more rather than less likely to have home lives in which unharmonious relationships are to be found. It is in such cases with

to gain sympathy and attention; post-operatively she was mistress of herself. 'You can't do what you like with Winnie any more,' said one of the family, 'she stands up for herself now.'

These cases should suffice to show how, in the life situation, the post-operative state may be influenced by the environment, so that the latter may bring into prominence disagreeable personal characteristics which have always been present, but which were pre-operatively held more or less in abeyance as a result of the more complicated thinking and feeling, which led to more restraint in self-expression and a greater sensitiveness to and concern for the feelings of other people. This does not mean, however, that post-operatively the patient is necessarily less easy to live with. It merely means that where the environment has evoked hostility, it will evoke the same hostility more readily, and more primitively expressed, when the patient returns to it after operation.

It will also be realized that the degree of insensitiveness and accompanying selfishness that is found after operation may be much less than was in evidence during the illness. For example, a middle-aged woman who had always been self-centred and demanding developed a prolonged depressive illness in a setting of retirement to a suburban existence which she found dully trivial compared with the stimulating and complicated social life, with its influence and prestige, which she had enjoyed as the wife of a distinguished official abroad. As a result of this illness she spent 8 years virtually in bed, from which she tyrannized the household; she was agitated, fearful, low-spirited, hopeless, bewildered, and intolerably exacting. She was entirely self-centred in every way. Her husband, one of those few people who is assured of a passport to heaven, bore this burden with a tireless patience. He insisted quietly, 'She's not querulous for the sake of complaining, but because she *really is* anxious and afraid.' His knowledge of her enabled him to recognize as symptoms of illness those traits that were foreign to her previous personality. His confidence was abundantly justified. After operation she was still self-centred and demanding, for that was her nature, but she was perhaps less so than she had ever been; the querulousness and hopeless fearfulness had gone. 'She's lost all that fear if I go out,' he said, '. . . now, she doesn't mind at all. She's much more

even occasional extravagant gestures) at playing the role of dutiful daughter. Post-operatively the lowered drive ('all she wants to do is sit down and mope about'), with absence of histrionics and of generous or suicidal gestures, the lessened restraint, the more primitive mentation and behaviour: the three combining, within the framework of the previous personality, the patterns of which survived the operation, to produce an indolent state with insensitiveness to the feelings of others, indifference to social duties, selfishness, and outspokenness to an extent which now rendered her formerly concealed hostility quite plain. One point needs amplification: when the mother said, 'It doesn't matter who comes up here, she'll generally have a row with them all,' she was referring—as she later made clear—only to members of the family. The patient behaved perfectly to strangers, and indeed to anyone who did not revive the emotional conflicts that had become woven around her family life; she was aware of her unpleasantness to her mother and freely admitted it; she criticized herself for it in a conventional sort of way, but without conviction. The diminished affect was, in fact, the crucial therapeutic feature of the case. Whereas the patient had had 7 years of histrionic storms in a setting of conflict over a broken engagement from which she had hysterically retreated, and had spent 6 of those years almost continuously in mental hospitals without benefit, except quite transiently, from any form of treatment, she had post-operatively become calm, relaxed, and free from conflict, though stimulated to irritability by a tough, coarse mother whose robust materialism was entirely antipathetic to her own romantic maunderings. As regards relief from distress the patient gained enormously, even if the mother did not. Within a year of operation she had a job for the first time in 7 years, and she has held it since. It is interesting that when, 2 years after operation, she came home from work to find that her mother (the source of so many emotional conflicts which had submerged her like tidal waves) had unexpectedly died while alone in the flat, she was quite able to cope with the situation. She cried a little, called in a neighbour for help and moral support, laid out the corpse, notified her brothers and sisters, and next day made the funeral arrangements. She reflected that she had not made her mother's last years as happy as she might, but she felt she could not have helped by far the greater part of it, and she remained resigned and calm. Her diminished affect was, therefore, a source of strength to her; previously she had been driven this way and that by morbid fears, feelings of inadequacy which thwarted undue ambitions, vacillating doubts, and strenuous efforts

to encourage a pattern of behaviour which is of reduced complexity; the reduction of complexity shows itself mainly in a tendency, more obvious than before, to seek the pleasurable and to avoid the irksome.

The post-operative intellectual life

Of this we have less to say, because there is less of which we can be sure. The elusive nature of the intellectual changes, as we have already noted, makes them difficult to define. Further, the reduction of self-awareness discourages introspection, so that the patient generally shows some lack of insight into his altered state. In some instances this is carried to a remarkable extent, and the disadvantage that it reduces the chances of self-improvement through the patient's own conscious efforts, is partially offset by the advantage that it spares him from what, in some cases, might be painful knowledge. It deprives the observer, however, of a useful source of information. This disadvantage is especially marked as regards the intellectual changes, which are so difficult to understand and to observe, and of the existence of which the patients seem especially little aware.

We may start with the tentative assumption that it is through the very nature of these intellectual changes (of the existence of which, though he cannot prove it, the writer is convinced) that the patient is unable to describe the alterations in his intellectual state. It is true that the post-operative attitude may have some influence. Where there is an avoidance of effort and discomfort, with a focusing on the pleasurable rather than the painful which is enhanced by the tendency not to worry, the patient experiences a sense of well-being, little troubled by nagging thoughts and inward promptings to perfection. This attitude may not be conducive either to the optimal performance of an intellectually intricate feat, or to the neat analysis of difficulties encountered in such a process. But both the intellectual 'deficits' themselves, and the absence of awareness of them, suggest that there is some operative factor other than a mere change of attitude. The blindness to such a deficit would seem to be part of the deficit itself.

The uncritical acceptance shown by the patients suggests an absence of those intellectual qualities which are involved in

unselfish than she was, more affectionate. She comes into my room and kisses me; she hasn't done that for years. . . .'

We may summarize our findings hitherto by saying that the lowered post-operative drive is associated with a diminished activity with consequently reduced initiative and a tendency to procrastination. On the affective side, this is paralleled by the state of placidity with reduction of the intensity of emotional experience. The net effect is to make the patient on the whole less responsive. The diminished responsiveness is chiefly seen in more rather than less subtle form, such as failure in expressing appreciation, in fulfilling social demands, in considerateness and tactful behaviour to others. In general, the patient is slightly more primitive. As a part of this primitiveness, there is some lack of restraint, chiefly seen in the more ready and frank expression of irritability, though this, as a rule, is quickly over. The behaviour to strangers is usually formally correct; it is in the more relaxed and less exacting atmosphere of the home that undesirable elements in the behaviour are most likely to appear. When they do, it is partly because the patient allows his standards to fall to their new natural level, but in the more extreme instances it is nearly always because old-established and unsatisfactory family relationships arouse in the patient old-established antagonisms which are now expressed more primitively and with less restraint, because the post-operative personality as a whole is a modified version of the pre-morbid one. The extent of the modification varies much from case to case, and will of course depend, *inter alia*, on the residua of illness that are left behind. If, in the absence of such residua, the post-operative personality is very much different from the pre-morbid one, this will be due to removal of such neurotic mechanisms as morbid fears, obsessiveness, etc.; such removal may allow the freer post-operative expression of various traits of character which, always present, the neurotic mechanisms had masked or held in abeyance. Freedom from such mechanisms confers on the patient a sense of emancipation, with a reduction of self-consciousness in all senses of the term; the effect of this is towards extraversion, with disregard of symptoms that are distressing and with less awareness of them, but it implies also a reduced awareness of obligations and duties, especially if these are unwelcome. The net result is

general conclusions arising from what they have seen or read. Where the conversation does express ideas these are often themes which had been pre-operatively developed, or, if they are new, they are usually either impracticable or arise from a patient of markedly intellectual habits. Such exceptional incidents, therefore, as when CASE 251 (page 293) was sufficiently reflective to have expressed surprise that the operation was not disapproved of by her Church, and when another patient produced a theory to account, by special reasoning, for the popularity of historical novels, have caused the observer a noticeable shock. The tendency away from the conceptual and complex towards the concrete and trivial is illustrated also by the not uncommon post-operative habit of applying for all sorts of free samples, catalogues, brochures, etc., which the patient may see offered in advertisements, but in which he had betrayed no interest before.

It is felt that it is not only through want of effort, but through some actual change in intellectual processes, that the literary habits of patients also tend to alter. Certainly, they may find it easier to read what is at hand rather than to walk down to the library, and it may be for this reason that some patients prefer to re-read old favourites rather than to embark on something new; it may be for this reason, too, that some patients show a far more catholic taste, with a tolerance of love stories and 'Westerns' that they would have scorned before. But it would seem doubtful that such alterations in taste are entirely to be accounted for in terms either of disinclination in a physical sense, or of a 'don't care' attitude arising from affective blunting; for there have been instances of patients with good preservation of their active habits, and with minimal affective changes, who have shown small post-operative inclination to literary pursuits, in contrast to their former custom. Many have ceased to read books in favour of papers and magazines, and, indeed, out of a group of 37 patients who were habitual readers and who were considered to have recovered after operation, 17 (or nearly half) had not read a book at all at 6 months after operation, and 13 still had not at 6 months after that. It is true that one man at the age of 33 read for the first time a divinity prize which had been awarded him 20 years before, but he was a shining exception. By 2–2½ years after operation, all of the 37 patients had read a book of some sort, but

analysis, synthesis, and discriminative appreciation. In these processes feeling must to some extent be involved even if it be only in so far as it is that which makes them worth while; but such more purely intellectual processes as the relating of one thing to another, the arousal of associations, and the formation of concepts with simultaneous attention to the various aspects of ideas—these are involved also. If the feeling is reduced, as it appears to be, the ability for such intellectual processes appears to be diminished also.

As a part of the patients' uncritical acceptance, the satisfactions of life tend to become simpler. Much depends on previous habits, and on how elaborate a level the patient was accustomed pre-operatively to live. In some cases, a good meal, a chair by the fire, and a glance at the paper are fulfilments enough for the leisure hours. Likewise, the intellectual range becomes less, so that world problems recede in favour of domestic issues. The thinking tends to become occupied with factual matters of immediate concern. Fears and preoccupations over health, though they may persist to some extent, are much reduced in favour of attention to concrete affairs. There may be a disappearance of hypochondriacal concerns, where these have been distressing and affectively charged, to an extent which is quite amazing; where they have been pursued as an interesting hobby, seemingly more as a result of choice than from neurotic compulsion, their disappearance is less dramatic, but they will give rise to far less in the way of spontaneous complaint. Special topics of preoccupation, on which there has been catathymic harping, lose their importance. Thus, a woman who for years had been obsessed and incapacitated by ruminations, leading to conflict and distress, on the desirability of avenging her murdered sister by herself murdering her brother-in-law when visiting him in Broadmoor, said after operation: 'I haven't thought of it at all. It doesn't seem very important.' The thinking, directed away from abstract matters of this kind, is more concerned with immediate events in the home or at work, with gossip and with trivialities. It is, on the whole, remarkable how seldom the post-operative conversation of patients is on an ideational level. They may talk of plays, and even describe them if asked, but their own spontaneity seems rarely to lead them to speculations or to

same. But in no case has it been felt that the standard of observation or of play has been high enough to warrant any reliance being placed on such conclusions; and the description of events at his bridge club by the only patient in the series who belonged to one, was such as to warrant the assumption (contrary to his own belief) that his play had shown a marked deterioration. The same difficulty applies to performances at chess, whist, and solitaire; several patients, of course, played these, but reliable criteria of pre- and post-operative comparison are lacking. The expectation is that experienced bridge players will show no changes in bidding except those due to removal of a previous neurotic timidity, and due to inadequate flexibility in coping with an unexpected situation: while they will carry out the play of the cards with routine facility but will fail, where they might not have failed before, in special situations demanding some safety play or coup. And it may be expected that chess players familiar with the openings will be able to play as far as they already know them, though less able to take advantage of unexpected errors by the opponent, or to deal with unfamiliar situations in the end game. That is the expectation; but to prove it is another matter.

In simpler and more routine forms of planning, however, we have noted difficulties in such matters as arranging the weekly household expenditure, and though such difficulties have not been great they have not infrequently been discernible to an extent which would warrant the judgment that the patient was post-operatively less prudent, and showed, in that regard, less grasp of the procedure than formerly—not to such an extent as to produce marked inefficiency, but sufficiently so to be of academic interest. Similarly, there have been patients who have gone on quite elaborate journeys, planned some time ahead, but without having ensured that the object of the journey could be achieved, or that the schedule was a practicable one.

It is possible, in this connection, that the lack of restraint facilitates the too hasty arrival at decisions in that associational arrangement of affairs that we know as planning, and thus contributes to an inadequate performance in conceptual thinking which we recognize under the term lack of judgment. But, apart from lack of restraint, many decisions are made by patients after

less than one-third of them read as extensively or as interestedly as they had done before. Even the newspapers are scanned rather than read, and there is a tendency to pay serious attention only to those items of immediate personal importance, such as rationing or release from rationing of clothes or food, or the successes of horses or football teams where a financial interest is held. Some patients frankly proclaimed their disinterest; one woman said, 'The papers? Oh, they're full of misery, I don't care about that.' Out of 43 patients living at large after recovery from affective disorders, no fewer than 28 were unable to relate any single item of news at 6 months after operation. All of them said that they read the papers and that they were familiar with current events; all made evasive replies at first, and it was noticeable that many of the 28 seemed to experience surprise when, under pressure, they were unable to impart any information at all. A further 6 were only able to say that we were trying for economic recovery. Other members of the family were in every instance able to tell some item of appropriate kind. At 12 months after operation no fewer than 13 of the 43 patients were still unable to relate any single news item, while a further 6 said casually that Russia was difficult to deal with. By 2–2½ years after operation there were still 7 patients who could retail no news at all, and the accounts given by the others were in general hesitant and scant. That the patients who said that they read the newspapers actually went through the motions of doing so was confirmed by the relatives; one wonders, therefore, if there were not some difficulty in conceptual thinking which prevented them either from absorbing or from reproducing what they had read.

It might have been thought that difficulties in conceptual thinking could have been observed in obvious form in the everyday lives of these patients. But this was not so. Chance allowed of the making of certain observations which are suggestive, but the true significance of which is doubtful, and these have been considered in the section on intellectual changes. Any hope that clear evidence could be gained from, say, performances at bridge has not been fulfilled. The usual finding is that patients who have pre-operatively shown timidity are post-operatively less cautious in bidding and more ready to take a chance in reaching high contracts, while the ability to play the hand is said to be much the

These are striking examples. But such failures in judgment are more often seen in that more abstruse form to which Golla (1947) has referred, when he claims that the fundamental change in these patients lies in their ethical valuation. Such a change can be very well illustrated by CASE 97 (page 395), who gave notice suddenly and for trivial cause, although under deep obligation to an employer to whom he had been formerly devoted. It can be seen also in less obvious form in a host of other cases in their treatment of minor social obligations. It might be that such changes have arisen solely from affective blunting; yet it seems as if there is also a failure of discriminative appreciation in weighing the several items of a situation, and that this leads the patient to form a concept of it on which he acts in a manner which, while satisfactory to himself, is often unsatisfactory to others.

We may summarize the matter by saying that, though it is difficult to distinguish between behaviour due to altered post-operative attitudes and behaviour due to purely intellectual changes, the intellectual lives of the patients are altered in certain ways. As part of their diminished self-awareness they lack insight into themselves, and into the very intellectual changes which none the less appear to exist. Their thinking is less exploratory and is more concerned with what is immediately at hand. Their intellectual needs are less. Their thoughts are turned away from themselves, as far as their former fears are concerned, while they show little concern over their physical state, or over what were formerly topics of preoccupation. But the things to which their thoughts are turned tend to be factual, commonplace, and often trivial. This is reflected in the literary taste, which tends to be more catholic and less critical while in general reduced. The difficulty in reproducing what is read suggests that there is a difficulty in conceptual thinking. This difficulty is believed also to be reflected in a relative inefficiency in planning, and in the formation of more naïve and less acceptable judgments.

The post-operative personality outside the home

Apart from the fact that many people believed to be hopelessly ill gain notice by returning to lead lives which are superficially normal, there is usually little to attract the attention of the casual

operation which are not unduly hasty, but which still show what we may call lack of judgment in so far as it seems that by no means all important aspects of the central idea have been held in mind. The extent to which this lack of judgment appears in obvious form varies, of course, with circumstances and whether those circumstances are such as to bring it into relief.

A telling example is that of CASE 28 (page 74), a 67-year-old solicitor, who, having retired through illness from which he had post-operatively recovered, showed an entire disregard of the general convenience of his household; he appeared superficially quite well, but he refused to pay the rates and he would not bother to bath or change his linen; he would not commit himself as to whether or not he would be at home to meals, or, if he did, he was liable to do the opposite of what he had said; he spent appreciable sums of money in writing not only for prospectuses of hotels for his holiday, but for brochures, catalogues, and other items of information quite useless to him, but which attracted his interest at the time. In this state, he was with difficulty dissuaded from impulsively selling his house at the height of the housing shortage, and moving without pre-arranged accommodation to an entirely strange town where he had no connections, on the off chance of securing a partnership which he had heard was being advertised by a legal firm to whom he had not even written. Later, he managed to get work locally, and continued at this for some 6 months before being asked to leave on account of lack of punctilio both in his work and his hours of attendance. He then, nearly 2 years after operation, again decided to sell his house, dismiss his housekeeper, leave his home town where he had lived nearly all his life and where all his relatives lived, and set up somehow in that other town to which he had intended to move before. Another patient decided to cycle some 200 miles to see his wife. He did not bother to calculate the distance, though he decided that it would take him roughly 2 days; he took what he guessed to be enough money for the journey and for a present to her as well; he covered only 30 miles the first day, stayed in a hotel beyond his means, drank whisky because he saw other people doing so, and took 4 days over the journey though he was given numerous lifts; he had spent all his money when 50 miles from his destination, and ended by selling his new bicycle, at a time when he knew they were difficult to get, for a sum which he knew to be miserably inadequate. This might all be due to a 'don't care' attitude, but it suggests a failure in conceptual thinking as well.

before; neither was imprisoned except while on remand, but both were convicted of theft. One of these was a psychopathic personality and a pathological liar who pleaded guilty to petty stealing. The other was a patient who combined obsessional with manic-depressive and schizoid features, to whose personality theft seemed foreign. He claimed, indeed, that his action arose out of a hurried mistake, and it is possible that this was true. A third patient, also a psychopathic personality and pathological liar in whom the police had more than once been interested but who had never been convicted, repeatedly stole from home after operation and pawned her parents' effects; she had previously done worse things but in more subtle fashion; she returned to hospital without coming under the jurisdiction of the courts.

The post-operative personality in the work situation

It might be thought from this catalogue of personality changes, with the inertia, the reduced affect, the diminished restraint, the restricted interests, the avoidance of effort and discomfort, and the difficulties in conceptual thought, that there would be no question of these patients working after operation. But that is not so, for the changes that we have been describing are not absolute changes but trends. Many patients work, and work satisfactorily. Some, of course, retire; some work in a humbler capacity; some work on the same level as before, though less well; in some hardly any difference in performance can be discerned, and in some no difference at all.

There was one trend, which was not general but which is perhaps unexpected, and that was that the patients tended to change jobs more frequently than before, sometimes for inadequate reasons. This might seem opposed to our concept of them as being inert and uncritically accepting; but we have noted as one aspect of the latter a tendency not to strive; and so it is that where circumstances make demands upon them, the patients do not strive to adjust to the circumstances, but rather seek to change them. This is in line with what we also noted in their tendency to be stirred to action, despite their inertia and acceptance, when outside events seriously affect their comfort and well-being. In fact, where they are themselves directly affected by stimuli that jar them, they will seek a *milieu* where a greater

observer to the post-operatively recovered patient. It is possible that at work there may be some irritability, a comparative lack of zeal, a somewhat reduced ability to cope. It is possible that there may be occasional incidents of snappishness or outspokenness in frustrating situations. It is not uncommon for the patient who cannot get what is wanted from a shop to cast some rather tart aspersion on the shopkeeper. Some patients who were shopkeepers have also been snappish with demanding customers. (No instance, however, is known to the writer of a leucotomized customer meeting a leucotomized shopkeeper.) Yet on the whole the great majority of patients show no obvious outward abnormality.

The social life is perhaps slightly simplified after operation in that there is usually less zest for committee work, and less initiative in attending social functions or following such activities as the theatre, concerts, or sporting events. Yet, all these things are done to some extent.

New friends, as has been noted, are seldom made; on the other hand, it may be that an occasional patient, rendered less shy by operation, will for the first time join a club, and so acquire acquaintances.

There is some tendency, difficult to evaluate precisely, to lessened religious observance, though this is not always the case. But a falling off in church attendance is the rule rather than not, even when any alteration in religious feeling is denied. Where there is such denial it is probably due to lack of insight. One girl observed, 'Sometimes I'm rather lazy on going to bed, and pray while I'm lying down.' This she had not done before. And a state of affairs probably not uncommon was described by a patient with unusual insight (CASE 251, page 293), who stated that her religion had, to her dismay, *become a cold duty* rather than a living inspiration.

Hutton (1947), in making similar observations, consolingly concluded that, if there was no increase in virtue after operation, there seemed equally to be no increase in vice. In our present series of 300 cases there was only 1 who was known to have been in a civil prison on conviction before operation, and he has been in prison since. But 2 patients have been in the clutches of the law since operation, who had avoided them

who has been thoroughly efficient. The seventh was an electrician, who worked satisfactorily and earned £7 1s. a week after 12 years continuously in mental hospitals. The eighth did domestic work outside the home as well as looking after an elderly mother; she performed her tasks excellently.

In fact, of these 8 cases, 5 have been able to show their former efficiency in sustained form, but 4 at least of those 5 have been employed in the less exacting forms of work.

Of the remaining 15 cases, there were 5 who returned either to their previous job, or to one on much the same level, but who subsequently changed to another, also on much the same level. A secretary, *under much obligation to her employers*, became increasingly paranoid with a frank breakdown with recovery, followed by further secretarial work. A printer changed his job 3 times for reasons that were genuine but *seemingly* inadequate. One patient became a cashier, could not manage the books, and became a telephone operator. One patient resumed her functions as housekeeper, but changed jobs repeatedly through what amounted to caprice. One patient resumed work in a factory, was dismissed for unpunctuality, and resumed work satisfactorily in another factory. All except the last of these 5 cases still show some impairment of previous capacity. In addition, 1 patient, a solicitor driven to retirement through illness, who showed impaired judgment in various respects, was post-operatively employed by another firm, but after 6 months with them was asked to leave, mainly because of unpunctuality.

Of the remaining 9 cases, 4 took jobs below their previous level. A civil servant became a shop assistant and changed jobs erratically. A skilled worker became an insurance collector, could not manage the books, and became an unskilled factory worker, as did the third case. The fourth, formerly a nurse in training, became a children's nurse for some relatives.

Of the remaining 5 cases, 3, who had previously worked as a dentist, as a secretary, and intermittently as a dressmaker, have post-operatively done no work. Finally, of the last 2 cases, 1, who had retired, re-started a business which failed largely through errors of judgment: the other, a lady of means who had not previously worked nor had need to, became employed enjoyably, if humbly, on the land.

measure of comfortable inertia may be obtained. Such a trend is facilitated by their post-operatively increased confidence, born of the tendency to worry less and therefore to ignore potential difficulties, and aided by the simpler and less deliberative outlook.

The facts as regards work were these. Of the patients with affective disorders, as has been said, 60 were discharged from hospital recovered, in the sense that they were virtually free from symptoms of which they had formerly complained, and were well enough to resume their previous lives. Although 4 relapsed between 1 and 2 years after operation, all were out of hospital sufficiently long for their powers of performance to be assessed.

Of these 60 cases, 12 were already retired, and they showed no less ability to look after themselves after operation than they had before they had become ill.

Of the remaining 48 patients, 25 were housewives. Four of these were less efficient than before to an extent which caused inconvenience, and which must be considered unmistakable evidence of impaired performance. Three more were slightly less prudent in household management, though this was of academic interest rather than an inconvenience, and were considered both by the relatives and by the writer to show impaired performance in fact. That is, 7 out of the 25 housewives, or 28%, showed some impairment.

Of the remaining 23 cases, 8 returned either to their previous jobs or to others almost identical, and apart from 1 who relapsed after more than a year, they have so continued since. One was a doctor, who has contrived to make a living, though there is reliable evidence of impaired performance, particularly in judgment of the seriousness of illness. One was a trained nurse, successfully employed for more than a year before relapse, though, as it happened, without much responsibility. One patient returned to his own business which he ran jointly with his wife; post-operatively he left the bulk of the work to her, but he managed well when she was away, and after some initial difficulty kept the books and controlled the stock, though without the same grip of them as before. The fourth was a tea-taster, whose work has been satisfactory. The fifth was a commercial traveller, who continued to be successful. The sixth was a shoe-repairer,

them, it is quite easy to over-emphasize their importance in the life situation.

After all, the 'deficits' in activity do not amount to much more than a state of 'not being on tip-toe' by 2 years after operation. This was admirably expressed by a patient who said, 'I can get through my work all right, but when I get home I don't feel ambitious to do things like I used to.' There is a tendency not to occupy the leisure hours, to lack initiative in finding jobs to do or entertainments to enjoy. There is a reduction of spontaneous activity which careful observation, and a knowledge of the patient's previous habits, may enable the observer to perceive. There is some reduction of the affective charge which, by 2 years after operation, is likely to be discernible only on close acquaintance, or by those who have kept fresh in mind their memory of the patient as he was before the illness. It will show itself by a lack of responsiveness and interest that is only of a comparative kind. There is a certain pedestrian quality of mind which, on prolonged acquaintance, may be found to render the patient somewhat boring; but that is to say that he is abnormal only in relation to what he may once have been. His conversation may veer towards the trivial, and, through a certain automaticity and repetitiousness, may seem empty, lacking in vividness and in imaginative flights. But so is that of many people. His interests, like those of many of us, may be restricted, and with that there may be a certain insensitiveness, with lack of finer shades of feeling, lack of finer appreciation, lack of awareness of the finer implications of events. He may be considerate, but without the finer shades of consideration; he may even be sympathetic, but he will not be readily or intensely so. He may be irritable, but his irritability will quickly subside. He may be outspoken and direct, even a little tactless, but there will be no malice in that. His activities will be directed mainly towards pleasing himself, and he is unlikely to be altruistic or self-sacrificing. He will not make difficulties, nor worry much; his decisions are likely to be direct and achieved without much deliberation; indeed, he may decide without sufficiently surveying the different aspects of the situation, and in so far as he does so without deliberation or expression of concern, he may seem not to worry enough. His prevailing mood will be one of cheerful equability, as one who anticipates

The evidence, as far as it goes, shows that 39 out of the 60 patients recovered from affective disorders resumed their previous jobs or the close equivalent, while a further 12 who had retired some time before resumed their lives much where they had left them off. But of the 25 patients who worked as housewives, 7 (or 28%) showed some impairment, though this was significant in only 4 (or 16%); of the other 14 who resumed work at their approximate former level, 8 (or more than half) showed some persistent impairment of efficiency. Four patients (or 6·6%) took jobs below their previous level. Three (or 5%) did no post-operative work at all. One resumed business but failed in it, and 1 worked for the first time, but in humble capacity. In the higher grades of occupation, the doctors were able to continue, but were impaired; the solicitor was asked to leave his firm; the trained nurse relapsed; of men running their own businesses, 1 left most to his wife and the other failed. A tea-taster, a commercial traveller, a secretary, a telephone operator, an electrician, a shoe-repairer, a children's nurse, domestic and factory workers, have all been able to maintain themselves. Three out of 13 patients who were employed outside their families changed jobs for inadequate reasons. This last tendency was seen more clearly among the recovered patients from other disease groups. Changes of job, undertaken light-heartedly and for dubious reasons, by patients who were employed outside their families, were seen in 3 out of 9 obsessionals, 3 out of 4 psychopaths (2 of whom had been steady at work before), and in 10 out of 21 from the schizophrenic groups.

An assessment of profit and loss

That nearly all patients, if not quite all, show demonstrable changes after pre-frontal leucotomy, and that these changes have their undesirable aspects, there can be no doubt. The sort of findings that we have been considering, derived from the study of 60 patients who had recovered from affective disorders, are reproduced also in patients from the other groups of illness, and can be discerned in those that have recovered from them as well as in those who have not. In trying to portray the post-operative picture, these must, therefore, be stressed. But in so stressing

common hall, 'Why the hell do you make such a row?' could go anywhere now without fear of a scene.

It is in the home, as has been said, that there is the greatest danger of persistence of undesirable traits; and it is in the home that that matters most. It is also there that that tactful handling which so much mitigates unpleasantness by not provoking it, is the least likely to be achieved, for it is in the home that familiarity has bred automatic response. 'I don't bottle it up any more, but I don't mean anything by it,' said one woman, truthfully enough, and, as she did not automatically provoke hostile responses from her relatives, she lived with them peacefully. It was otherwise with a man who had an argument with a provocative sister-in-law to whom he had long felt an antagonism that was mutual. He said that geraniums were grown from seeds and she said they were grown from cuttings. She became so angry and he became so menacing that she picked up a stick with which to defend herself. This annoyed him further, so that he grappled with her for its possession. His wife, sufficiently alarmed to seek help, ran out into the street and brought in two stalwart passers-by. They showed much interest in the struggle, which the patient finally won. He replaced the stick in the umbrella stand, turned the passers-by out of the house, took an airing in the garden, and within 5 minutes was academically discussing the best place for bedding out the plants. Such was the depth and malignity of the irritation that he showed! But the sister-in-law would no longer tolerate him in her house. It is where feelings of this sort prevail that chronic awkwardness ensues; but the effects of operation are to blame only in so far as they reveal the undercurrents which, if formerly hidden, were always there. Yet the irritability tends to be so short-lived (though it may be frequently revived), that even where it is marked, the patients may be actually easier to live with than they were before, in so far as there tends also to be an absence of sulking.

Of course, a few of these patients were post-operatively intolerable to their relatives, but most of those had been nearly so before. Everyone in medical practice is accustomed to meet difficult people, and the amount that relatives will put up with is a continued source of astonishment to all psychiatrists. The

no trouble. He will not be self-critical, but he will be confident; in face of a contrary attitude, he may even be a little patronizing. He will not be a vivid, piquant, or stimulating person. It would not be possible to say of him as Meredith said of Whistler, 'The springs in him are prompt for the challenge,' nor as Dr. Johnson said of Lord Monboddo, 'I would go a hundred miles for his conversation.' On the contrary, he will be a comfortable person, though not a comforting one. At his work he will be adequate, but neither brilliant nor over-conscientious.

If this is the best that can be said, it is not a bad best.

Of course, such monochrome will be coloured by events past and present, as well, perhaps, as by residua of illness, or by recurrence. And in the earlier post-operative phases there may be trials to be borne. Thus, a clergyman's wife, during her convalescence, was chatty about her incontinence in the lounge of a seaside hotel. A doctor in a cinema said, in ringing tones, 'For Christ's sake, sit down.' ('Many might have thought it,' said a relative, 'but he said it.') A woman, moved by the peroration of a sermon, encouraged the preacher with a loud 'Hear, hear.' A Rabelaisian character alienated all her husband's friends by sarcasm, and embarrassed him by addressing her male acquaintances as 'Old Cock.' Yet, even in such matters as these, the patients were not without powers of selection; the last-mentioned patient did not address the writer as 'Old Cock' (rather to his disappointment), and the husband had known that she would not; the girl who said to the village bore who had come to tea, 'Why do you come so early? But, of course, you always do . . .,' was capable of complete decorum elsewhere. The importance of such events depends, as Curran (1948) has pointed out, on the sensitiveness of the relatives. When a sprightly old lady, seeing the writer's elderly tumbril parked in the street, exclaimed, 'My, that's a dingy old car,' it was perfectly true, and there was no need for the family to have been embarrassed. Although many of these patients remained less restrained than they had been before they were ill, the post-operative crudities of expression did not continue. The doctor would never now cause public embarrassment; the clergyman's wife, though very outspoken, is more discreet; the patient who applauded the preacher is decorous enough; and the man who shouted to his neighbours, who shared a

The findings, in terms of figures, were as follows. There was 1 case in whom virtually no personality change could be detected at all, either by the observer or by the relatives. She was a simple, somewhat negative person, who fitted well into a family circle where she was fondly received. She suffered from manic-depressive psychosis, and although she relapsed into a state of modified hypomania with some depressive content in the twenty-first post-operative month, she was, while well, to all intents and purposes the same person post-operatively as she had been during her normal phases before operation. In a second case, the only post-operative change that could be discerned was a slight restriction in interest and in enterprise.

There were 14 other cases, making 16 in all, who were considered by themselves and by their families to have recovered without any significant degree of impairment, in the sense that they not only carried out their duties in and outside the home in a fully satisfactory manner, but were on excellent terms with their relatives and associates, had resumed their social lives, and [illegible] was not appreci- [illegible] before they had become ill. There were, in fact, some small changes to be discerned, such as a less discriminating literary taste, slightly less grim determination in tackling the spring cleaning, a just noticeable reduction in diffidence, and things of that sort. In 1 case reduction of lifelong hypochondriacal preoccupations enabled the patient actually to take more interest in outside events and to show more initiative than had formerly been possible. In 2 of these cases there had been an initial period of awkwardness before the patients became stabilized. One woman who had long felt a subtle rivalry towards her daughter, whom she felt to have usurped her own position during the illness, was exceedingly difficult and outspoken towards her, though still very loving and diligently attentive towards her paralysed husband; this phase lasted for just over 6 months, after which time she returned with surprising rapidity to approximately her pre-morbid normal. Another woman, doubts of and resentment towards whose husband had been a contributory factor to her illness, refused to speak to him at all for 10 days soon after her return home, and was irritable and tiresome for a few weeks. But by 6 months

post-operatively difficult patients had always been difficult, though perhaps in more subtle and less obvious ways.

And there are other aspects of the matter of which we must *not lose sight. Every one of these patients, even the difficult ones,* felt benefit in that they were relieved of symptoms. That must be respected. Even those families who were left with post-operative 'problem relatives' were spared the distress of continual exposure to symptoms, where the patient had been pre-operatively much at home. In some instances they had been obliged for years to listen to a farrago of querulous and hypochondriacal talk, poured forth by a self-absorbed, self-pitying, irritable, and agitated patient with few variations on a repetitive theme, which had continued daily almost from the moment they had opened the door until they had left the house. In other instances they had experienced the weekly or bi-weekly distress of seeing a person of whom they were fond eking out an existence, year by year and without improvement, in the last extremity of wretchedness. Some of these families were spared much in the way of expense as a result of operation. Even where expense to the family was not involved, there has been some small relief to the ratepayer.

But apart from these, there were cases in which the post-operative personality was so much improved compared with the pre-morbid best, that the 'deficits' were of negligible consequence. One such woman, who had produced recurrent 'scenes' through years of histrionics, was brought from a nauseating and maudlin sentimentality to an engaging straightforwardness. In describing a film she had seen, which portrayed an hysterical psychopath, she said, 'The woman was just like me as I was. Before, I'd have been full of compassion, but—it was funny—I didn't feel the least sympathy with her. I kept on thinking, "You spineless creature," and I felt like shouting out, "Go and have a leucotomy."' The reduction of her affective charge had immediate practical value, for she no longer made scenes nor sulked. Indeed, when asked by a friend how she put up so easily with the crossness of her husband (of whom she was very fond), she had replied, 'Isn't it strange? I don't seem to mind.' Other cases, rendered less finicky and less exacting in the home, allowed, in some instances for the first time, an atmosphere of pleasant relaxation.

disinterested in outside events, by contrast with previous habit, and both were slower, less active, and less ready to help. One woman's talk became inconsequential and gossipy, so that she was occupied with trivialities where she had been less empty before; but she was effective as a housekeeper, as a hostess, and in minding the business in her husband's absence. Another woman, in contrast to the more usual post-operative proneness to generosity, through being rather less thoughtful and considerate, became far less open-handed. Those were the sort of things that were found, but they were compatible with entirely amicable relations within the family.

Thus far, then, we have 30 cases in whom the results have been thoroughly satisfactory. Not only had these people been hopeless chronic invalids whose symptoms had been relieved by a procedure of which the avowed object was the destruction of a part of their brains, but all 30 were able to exchange life inside a mental hospital for life at home. Further than that, by the time that a year had passed since operation, 16 of them had been able to resume happy and successful lives which differed in no appreciable way from those that they had led before they became ill. A further 4 were in various respects better than they had ever been, in that—though not entirely easy to live with—they were if anything more so than before, and had been relieved of their affective disorders as well. And the other 10 cases, though they showed post-operative changes which indicate some reduction from their previous best, were able to live as ordinary people, discharging their duties and looking after themselves in a manner which not only entitled them to their position in the home, but which rendered them unreservedly welcome additions to the family.

This is sufficiently remarkable, but there were a further 12 patients who did only a little less well. The workers among them all returned to their former or almost equivalent jobs, went to and fro every day, and worked satisfactorily. Those who were not workers in that sense, resumed their previous lives. None of them needed special attention or looking after. Yet there was a difference between them and the foregoing cases which may perhaps be indicated by the fact that their associates found it necessary in some respects to make allowances for them, though

after operation the husband said, 'In many ways she's better than I've ever known her.' At a year after operation he said, 'We've been married 15 years, and this is the best 6 months we've ever had.' Apart from these 2 cases, who reached a very good adjustment in a matter of months, the rest of these 16 patients had resumed their former lives without difficulty and with great success.

Next we must consider 4 patients who had always had undesirable personality traits, and who had at no time shown the steadily sustained efficiency of the foregoing cases. Two of them were chronically anxious, irritable, and hypochondriacal women; post-operatively 1 of them was markedly outspoken, but was considered on the whole 'less peppery' than had been her wont; the other was a shade over-familiar and readily spoke her mind; but both were in some ways easier to live with than they had ever been. The third was an egocentric, histrionic, selfish, and demanding woman; post-operatively she was less so, as she was slightly lacking in drive and had become resigned to the impossibility of having all her demands fulfilled. The last was a chronically anxious, diffident man who had over-protected himself; post-operatively he was more adventurous and an excellent mixer, as a result of which he showed a slight, but not grave, tendency to drink one more glass than was wise, whereas he had been afraid of alcohol before. All 4 of these patients were rather different personalities after operation, and none was very easy to live with. But none had been easy to live with before. Although 1 was unrestrained so far as to be garrulous, another was empty and trivial, another was irritable and over-candid, and the last was rather too insouciant, their post-operative states had some distinct advantages even over their pre-morbid ones, and the results in all 4 could not be considered other than eminently successful.

Then there were 10 cases who were all quite effective within their own spheres, and were found thoroughly acceptable in the home, but in whom there were post-operative changes which rendered them certainly less, as people, than they once had been. For example, 2 men were less considerate and affectionate to an extent which was noticeable compared with their former habit but which did not, in fact, cause actual distress. Two women were

keeper, who had been obliged by the patient's inertia and incompetence to assume authority in the household, that she drove the poor woman out: after which she was compelled to make a muddle of the household management herself, which further exacerbated her ill-temper so that she was rude to the tradespeople. She had always been intolerably aggressive and self-centred, domineering and outspoken. Her husband, a quiet, considerate, intellectual, and kindly man, [illegible]
of him to th[illegible]
what I liked [illegible]
post-operatively, if possible, it was worse. She patronized him as though he were a fool ready to be taken in by the simplest trick. If he entered the room in the ordinary way, she would start up, snapping irritably, 'Why must you come in and out like a whirlwind?' And when he came in with considerate quietness she would grumble, 'What are you afraid of, creeping and slinking about like that?' The husband showed great fortitude, helped by a certain wry humour and by scotomata derived from his religious outlook, in bearing with this arrogant, patronizing, ill-tempered, selfish, hectoring, and empty-headed woman, whose muddle-headed incompetence (now increased by intellectual impairment into which she had no glimmer of insight) rendered his domestic life chaotic. But we must not over-draw the picture; although she was now a caricature of her former self, she had always been a good deal like this; even post-operatively she was capable of correct behaviour and was at times affectionate and pleasant enough; and she no longer diffused that suffocating atmosphere of hypochondriacal, self-pitying, and querulous depression with which she had formerly managed to permeate the house.

There were, unfortunately, other instances. 'Ah, Mr. B. doesn't have it all his own way now,' said one patient, with a wicked wink, and indeed she saw to it that he did not. On one occasion, with a determination and restraint post-operatively somewhat unusual, she did not speak to him for a fortnight, though she continued to look after the house and was a good mother to the children; on another occasion, through a fit of sulks also post-operatively uncommon, she refused to go away with him on a holiday that had been arranged. She gloried in a new-found ability to assert herself, and, as though in compensation for years of bondage to neurotic symptoms, she revelled in establishing a determined independence. Of another case, whose

this had not been necessary before. The families fully accepted these patients, were thankful for and derived pleasure from the operative result. Indeed, they had little about which to complain. But they had not infrequent reminders that the patients had changed, and these reminders were such as to keep them aware that they were living with a person who had had a brain operation after a long illness. They had resumed their positions just a little less fully than the foregoing cases that we have considered. They were easy enough to live with, but they had lapses from their former habits which were noticeable but not distressful. One patient, for instance, would suggest to his wife that she should do a thing, would forget that he had suggested it, and when he found that she had done it was liable to express a short-lived pettish annoyance. The wife of a small grocer, always an energetic and enterprising woman, reacted to her freedom from depression and a concurrent change to life in a dull village by a determined search for pleasure; she made excursions to London, was extravagant with taxis, went to America, and then announced her intention of visiting Switzerland; she did rather less in the home, took little interest in her husband's business, but danced him off his feet at neighbourhood socials to the accompaniment of many 'gins and Its.' In fact, they were quite well off and this caused no financial embarrassment, but her husband was continually aware that the patient was a less seriously dependable person, was more impulsive and more given to frivolity while a little more heedless of his feelings. The man who ran a business with his wife let her go to open the shop at 9 o'clock and himself followed between 10 and 10.30, and was sometimes off-hand with the customers. Another man, a steady worker, was less sympathetic with a wife who liked to be sentimental. But none of these were awkward or difficult people.

The same could not be said of the last 17 patients, all of whom gave their relatives, in one way or another, a difficult time. We have already seen the vignette depicting the home life of CASE 48 on page 93, of CASES 72 and 81 on page 50, of CASE 44 on page 91, and that CASE 63 was described as 'the most exasperating woman that ever lived.'

Another patient post-operatively spent all her life on a sofa reading novels, between which she complained so jealously of the house-

expressed on the post-operative condition of these patients have been derived directly from statements made by themselves and their relatives. The writer is satisfied that the opinions proffered were in the main correct and essentially based on the truth (though that has not been so at all points in this series). But the fact remains that what is acceptable in one home may not be acceptable in another, and there have been occasions when the writer has privately thought that some of the relatives were markedly tolerant and rather easily pleased. In most such instances the relatives themselves showed some adjustment in their views, so that those who had mainly emphasized, in an almost mystical way, the 'miraculous' early post-operative improvement, with neglect of the undesirable sequelae, dwelt more on the practical realities of the situation after a year or two, when the sense of the miraculous had begun to wear off. Thus, there was a tendency to gain a more balanced view as time went on. Even so, and though, as it is the relatives who have to put up with the patients, it is considered no part of the observer's function to impose his own cultural standards or personal bias on the clinical picture, it is felt that the results as thus presented may tend to give an impression that errs on the side of optimism. There were 2 patients among those 16 considered fully restored to health, and without significant drawbacks, who appeared to the observer to have become noticeably coarsened to an extent which in some families would have been considered offensive. There were 3 patients among the 17 awkward and difficult ones who in many families might have been considered so insupportable as to demand drastic action, but who were put up with tolerantly enough on the whole. On the other hand, the deficits stressed by the husband in 1 case were believed to be apparent rather than real and to have been magnified by a pernickety selfishness, while a number of the difficult and awkward patients would have been much less so had they been more intelligently handled. But, though we may bear in mind these possible adjustments of opinion, we must be content to accept the verdicts of the patients and relatives on whose behalf the operations were done and who are the only people materially affected. And that is that 43 out of these 60 patients have returned to be satisfactory and welcome members of their family circles, while of the 17

condition was complicated by senile changes, a son-in-law shyly observed, 'At times we *have* thought it might have been better if the good Lord had taken him at the operation.' Of another the doctor tersely remarked, 'Before, they were always terrified she was going to commit suicide, and now they wish to God she would.'

But we still must not forget that the patients themselves were eased of much distress, nor that, in so far as they were post-operatively difficult people, so had they been before.

In summarizing the matter thus far, then, we may say that of 60 patients considered to have recovered from affective disorders after operation, there was one in whom virtually no post-operative personality changes could be discerned at all. But she was a person at all times lacking in positive features, and therefore not one in whom such observations could be easily made. She, and 15 others making a group of 16, resumed her life so that it differed from that which she had led before in no appreciable way. Four further patients resumed the lives they had led before, and, though never very easy to live with and now with some post-operative deficits, were in some respects better than they had ever been and as a consequence of that were easier to get on with. Ten more cases had appreciable deficits when the post-operative was compared with the pre-morbid state, but these had to be looked for to be seen and did not affect their own or their relatives' lives in any important way. A further 12 cases resumed their lives at their former level in so far as they fulfilled their former functions satisfactorily; they did not manage quite as well as before, and there were incidents which kept the relatives aware that the patients were not quite what they once had been; but the level of health and function attained was quite compatible with harmonious relationships at work and at home, their return to which latter was unreservedly welcomed. There was a final group of 17 patients who were awkward and difficult people, with undesirable personality traits that had been pre-operatively present, and the post-operative exaggeration and persistence of which made for disharmony in the home. It is stressed, however, that all these people had been difficult before and that, having benefited from the operation, they themselves had no regrets.

At this point it should be made clear that the judgments

reaction to difficulty in the form of developing either neurotic somatic symptoms, or undue worry-states, or anti-social behaviour, we have 16 patients. Of these, 8 became post-operatively awkward and difficult.

This is perhaps to say no more than that those who were post-operatively the least satisfactory, had pre-operatively been those with the least powers of social adaptation. Those patients who were on poor terms with life, with their capacity for enjoyment stunted by jealousies and hostilities, who were rigid in such a manner as to exclude interests of a socially pleasurable sort, were those who did least well. On the other hand, those patients did best who had identifications which promoted social adjustment without incurring hostility, and who had consequently shown willingness to subordinate themselves, not through neurotic compulsion but through willingness in participation, in which they have regarded their associates not as rivals of whom they were secretly resentful or through patronage or denigration of whom they have gained a sense of superior adaptation, but as collaborators in the promotion of mutual interests. The same is true of the discharged patients, whether recovered or not, from the other groups of illness. The matter might be epitomized in a way which, while hopelessly unscientific, may none the less make some appeal to common sense; i.e. by saying that the nicer the person the better the result—where the word 'nice' is used in its more modern meanings, as implying kindness, considerateness, and agreeableness.

Finally, should it seem that these patients have lost much, that the price paid by them and the relatives is high, and that the results are therefore disappointing, it must be re-emphasized yet again that those patients who were post-operatively tiresome were pre-operatively tiresome also, and that all 60 were restored to lives which at least approximated to the normal, from states of chronic and wretched invalidism which had persisted, in almost all instances, despite prolonged and energetic treatment, so that the prognosis in absence of operation was in no case but one other than poor or hopeless. The post-operative result must never be judged except in relation to the pre-operative state. And what that was like, in all its lugubrious wretchedness, may be judged from the evidence about to be presented.

who are awkward and difficult, the relatives of no less than 8 prefer that the patients, despite their awkwardness, should be at home rather than elsewhere.

Penultimately, we must consider further the question of the previous personality and its influence on the post-operative state. This can be brought out if we classify our 60 patients in 3 groups, according to their pre-morbid personalities as well as we have been able to understand them. If the first group comprises those who have shown a willing adjustment to their families, with some social adaptation outside, some willingness to subordinate themselves to the common welfare of the group with which they have identified themselves, without marked hostilities but with a capacity for enjoyment and a reasonable reaction to difficulty, we have 23 patients. Of these, there have been 3 who have been post-operatively awkward and difficult; of those 3, it may be noted that 1 was an 81-year-old man in whom the picture was complicated by senile changes, while another had spent no less than 12 years continuously in mental hospitals, from which he had emerged into a post-war world at the age of 61, to compete with family and housing difficulties. All 3, further, were rigid people.

If we take as our second group, rather inclusively, those who have contrived a tolerable family adjustment though perhaps with subdued hostilities, but with poor adjustment outside the home: those who, despite a poor family adjustment, have shown satisfactory social adaptation outside the home with willing co-operation in their work: and those who have shown adequate family and social adjustments, but who have reacted poorly to difficulty, we have 21 patients, of whom 5 were post-operatively awkward and difficult. But in none of these 5 cases could the behaviour be reasonably attributed to external causes of anything like the same potency as those that militated against 2 out of the 3 awkward and difficult patients in the first group.

If we take as forming our third group those who had shown marked psychopathic traits, in the sense of egocentricity without identifications, with failure to subordinate themselves to the welfare of their group (or, if they did so, through compulsion by neurotic fears rather than through willingness), with consequently poor adaptation both in the home and outside it, and with a poor

may become very obvious where hostility has long been felt towards another member of the family.

(7) Out of 60 patients recovered from affective disorders, 16 showed changes so slight that their post-operative lives differed from their pre-morbid ones in no significant way. Ten more showed changes which rendered them less, as people, than they had been, but which yet made no important difference in their lives. Twelve more, while able to resume their former functions and affectionately accepted by the relatives, showed changes which served to remind their families that the patients had had long illnesses involving an operation on the brain. Four patients, though difficult to live with, were less so than they had ever been. Finally, 17 patients showed positively undesirable changes, in the form of hostility, irritability, obstinacy, and general tiresomeness; in 8 of those cases, however, the relatives still rejoiced that the patients were at home rather than elsewhere.

(8) Those patients who were post-operatively tiresome had always been tiresome before, though not necessarily to the same extent. They themselves, however, were happier, more content, and were free. They had no regrets.

(9) The better the pre-morbid personality the better is the post-operative result, so long as the word 'better' is here taken to include qualities of social adaptability, kindness, considerateness, and agreeableness. Jealousy, hostility, rigidity with poor social adaptation, when they existed in the pre-morbid personality, are likely to contribute to post-operative personality difficulties, though they can hardly be considered in themselves contra-indications to operation.

(10) All these trends are observable in the post-operative changes occurring in patients who have been ill other than with affective disorders.

(11) As regards work among the 60 patients recovered from affective disorders, 12 were retired and looked after themselves just as well after operation as before they had been ill; 25 were housewives, of whom 18 appeared just as efficient as before, and 3 more only very slightly less so,

SUMMARY

(1) The post-operative personality of the recovered patient may be viewed as a modified form of the pre-morbid one.

(2) The modifications occur as a result of changes in activity, in affect, in restraint, and in intellectual processes.

(3) These changes sometimes reinforce and sometimes offset each other through a dynamic interplay. They interplay with each other in various combinations according to the demands of the moment. They are thus not fixed 'deficits' but are trends. The extent to which such trends are present varies with circumstances.

(4) The post-operative state is therefore difficult to describe, not only because the extent of the personality changes varies in the same patient from time to time, but also because it varies greatly between one patient and another.

(5) In general, however, the trends are towards a lowered post-operative drive, with consequently reduced activity and initiative and with a tendency to procrastination. On the affective side, this is paralleled by a reduction in the intensity of emotional experience. The net effect is to make the patient on the whole less responsive. This is chiefly noticeable in such more rather than less subtle ways as diminished appreciation and sense of obligation and considerateness. The patient is thus slightly more primitive, with a less fine awareness. The reduction in awareness leads him to be less critical of himself, of things, and of other people. The reduction in self-criticism leads to an increase of confidence and to a loss of self-consciousness, and therefore to an increased extraversion. The tendency of the extraversion is towards the comfortable and the pleasurable, with an avoidance of difficulty and effort. Such an attitude is encouraged by the intellectual changes, which make for a more primitive mentation. The patients tend intellectually to be more empty, with restricted interests and simpler satisfactions.

(6) Untoward personality changes are observable more in the relaxed atmosphere of the home than when appearances are kept up before strangers. The tendency to the primitive

CASES WITH AFFECTIVE DISORDERS

It is, of course, possible to classify the cases in many different ways, but it has seemed best for our present considerations to regard our group of patients with affective disorders as consisting of 85 cases. There were, in fact, a number of others whose conditions presented as depressive illnesses, but which are more conveniently considered elsewhere. For instance, 2 markedly depressed patients were fundamentally obsessional: the condition of 2 other patients resembled involutional melancholia at the onset, but later developed many anomalous features: a fifth became demoralized and considerably depressed as a result of intractable pain. The 2 obsessional patients have been placed in the obsessional group despite their affective admixture, because it is considered that the latter arose as a reaction to the former: the patients who appeared at first involutionally melancholic developed features so anomalous that they were considered to belong more to one of the schizophrenic groups than to the affective disorders: the patient with intractable pain is dealt with in a small section on miscellaneous and mainly organically determined illnesses. Viewing the patients in this way, we are left with 85 cases to be considered under the heading of affective disorders.

We may classify these 85 patients very simply in the following way:

(1) Two patients had had recurrent attacks of mania, but without attacks of depression.
(2) Sixteen were essentially within the manic-depressive group in that they had shown evidence both of mania and of depression.
(3) Twenty-nine had had recurrent depressive illnesses, but without manic attacks.
(4) Thirty-eight had had single depressive illnesses, and were operated on at one stage or another of the only attack to which they had been subject.

We will consider these groups seriatim.

while 4 were inefficient; 13 returned to their previous jobs or the equivalent, and, apart from relapse in 1 case, have so continued, though 5 changed jobs for various reasons to others on much the same level; 4 took jobs, but maintained them, below their previous level; 1 worked for the first time; 1 started a business but failed; 1 resumed legal practice but was asked to leave the firm; 3 did not work post-operatively, but 1 of them helped to keep house.

(12) There was some evidence to suggest that those patients in the more skilled occupations had more difficulty in resuming their work than did those in the less skilled.

(13) The worth of the results must never be judged without reference to the pre-operative state and the prognosis in absence of operation.

of the mood, distractibility, and all the potentialities for developing excitement. In fact, the condition persisted in a modified and less vivid form. That this modification of his mania was not by any means entirely attributable to an insidious physical enfeeblement which became steadily progressive from the time of operation onwards, and which culminated in his death from obscure causes 3 months later, is suggested by the fact that a similar modification occurred in other cases with manic attacks but without enfeeblement, as we shall see later. It is presumed that this was one of those deaths which McLardy (1948) attributes to accidental interference with autonomic centres which control the bodily economy and maintain homoeostasis, through damage to their rostral connections.

Cases with both manic and depressive attacks

Of the 16 manic-depressive cases, 9 showed the illness in classical form. One, with auricular fibrillation, survived the operation only a few hours, and the death is considered attributable to heart failure rather than to cerebral haemorrhage. This leaves 8 classically manic-depressive cases for study.

The results were not impressive. Three of them were substantially unchanged.

In one, though the illness itself was classical enough, the picture was complicated pre- as well as post-operatively by epilepsy with dullness and backwardness. The patient left hospital, though his relatives were advised against removing him, and he was later returned. There has been no recurrence of depression in the 2½ years since operation, but there have been long periods of excited and irresponsible over-activity, while during quieter phases the patient has remained, as he was described in the notes, a 'rude, blustering lout.' The second (CASE 26), a woman of 46, had had 10 admissions to hospital in 8 years, over the last 6 of which she had spent three-quarters of her time in hospital; manic attacks had predominated, and she was operated on in a mild one. She returned home within a few months, as she had done many times before, but she now managed to stay there for more than a year. Some 8 months after operation, however, her attacks began to recur. But they were noticeably different, in periodicity, in length, and in severity. They were more frequent in that they tended to recur about every 3 weeks, but they would last only 7-10 days instead of many months. They

Cases who had shown manic attacks without depressive ones

One of these was a florid-complexioned, pyknic, bright-eyed old lady, with a merry bonhomous manner but a sharp tongue. She was 73, and had been under certificate since she was 55. She was almost a chronic manic, but would have a few months of remission now and again. As a rule she was aimlessly busy, sweeping in an energetic but undirected fashion, or dusting her room which was in amazing disorder. She talked on the least provocation, and would go on talking all day, in polite and humorous vein though with a paranoid colouring. At her worst, she would be intensely restless, screaming and roaring, barricading herself in her room, irritable, aggressive, and wildly unrestrained. It was felt that if she could be brought to any length of social remission she would be able to live at home with a nurse, and operation was therefore decided upon. She was arterio-sclerotic with a blood pressure of 182/120. What was not known, however, was that she had a skull of egg-shell thinness, as a result of which she sustained some unintentional damage to the brain at operation. No deductions can be drawn from the case, as it happened that at the time of operation she was in a quiet and normal phase, and remained so afterwards except that within a week she became comatose and died, as a result of haemorrhage which was presumably associated with the cerebral laceration.

The other recurrent manic was a man of 52 in his fourth attack in 9 years. If left entirely alone he was quiet, but the least stimulus was enough to evoke a torrent of conversation in which the initial theme was quickly lost. Although he had returned to normal and to work between the previous attacks, in this last he appeared to be deteriorating in that he was increasingly distractible, less retentive, and inclined not only to be doubly incontinent, but to smear and rub faeces about with a nonchalant good nature. After operation his spontaneity, excitability, and activity were all reduced, so that it was possible for him to be with other patients without provoking the mischievous tricks, the conversational deluge, and the uncontrollable excitement to which he had formerly been liable as soon as he had ceased to be on his own. But at the same time there was great pressure of talk as soon as a stimulus was applied, with persistent exaltation

taught me." My father, I may tell you, was a very "toney" man, he was important and used to wear a tall hat, he knew tone from the toes upwards, and if anyone got fresh with him he used to say, "You bugger off. . . ." '

(A similar development in the use of bad language in post-operative relapses into mania or hypomania was noted in 4 other manic-depressive cases.) The third patient, among the typical manic-depressives, who was substantially unchanged never left hospital after operation, though her manic phases also showed less fervour, and, though sometimes quiet, she did not complain of actual depression.

Thus far, then, we have 2 patients with recurrent manic attacks, 1 of whom died within a week, and the other of whom showed persistent mania in modified form until he died at 3 months after operation; and we have 3 patients whose manic propensities were modified by operation, but not to an extent which yielded significant improvement.

Two more patients were markedly changed by operation, but in a not altogether desirable way. One woman exchanged a state of depression with persistent worry and lamentation for a state of hypomania with elation. It is true that this settled quickly, but she has had mild hypomanic phases since, which have lent added prominence to a post-operative irresponsibility. The other patient was of special interest in that—one of those quiet and akinetic depressives which Kraepelin at one time believed to represent the essence of the depressive phase of manic-depressive psychosis (1904)—while she had shown phases of animated over-activity before, she entered a state of frank mania for the first time after operation at the age of 59.

A rigid and pernickety woman, with history of depression (with suicidal attempt) at 19, followed by remission until a second attack (with suicidal attempt) at 48, had been depressed, retarded, disinterested, and withdrawn without variation for 11 years. Post-operatively, she was still retarded, disinterested, withdrawn, inactive, and quite lacking in spontaneity. But there was a difference, for, almost from the time of operation, she insisted in a slow way that she now felt quite happy, whereas formerly she had always said that she was 'sad.' Six months after operation she showed no outward change, but she still said that she was happy and, though very

were also much milder and the content was less vivid. Whereas previously she had been excited almost to incoherence, a geyser gushing a thousand different ideas about this and that, vividly responsive and hostile when thwarted, now she showed only a steady push of chatter with a pottering restlessness. Whereas in former attacks pregnancy (which she always wanted) had been a prominent theme, she now restricted herself to the topics of marrying the superintendent of a mental hospital whom she much admired, and of a fortune which she was soon to be bequeathed, but she never mentioned the pregnancy at all. Her mood was one of fatuous and mild euphoria rather than of high elation. After observing her in this state at her home, it was noted that: 'This was a particular type of *hypomanic attack, with psycho-motor over-*activity but with a curious flatness, both in the conviction with which the delusions were held and the emotions that they aroused in her, as well as in the general emotional state apart from the delusions. It was not the sort of thing for which one could regard certification as an urgent necessity, though intolerable to live with, nor the sort of thing where one could feel the patient to be in danger of wearing herself out or inflicting real damage. It was a sort of modified hypomania, yet not the controlled type that one may find in educated persons anxious to appear at their best despite supervention of the illness, but a disinhibited hypomania which lacked the internal fire to blaze up into anything remarkable.' The lack of dynamite in this condition can be indicated by explaining that soon after these notes were written, the patient was still going about and doing her shopping, and made several transactions in a music shop with nothing appearing amiss until, having bought a grand piano, she insisted on waltzing with the manager until the police were called. One supposes that the proprietors of music shops seldom have such enlivening experiences. The other point of interest lay in her lack of restraint. In these attacks she used bad language for the first time. Formerly, she had been mincing and genteel, attaching special values to being 'ladylike,' which was one of her favourite words. Now, she was more primitive, though she aimed at her previous standards, and when seen still in hospital 2 years after operation, she said what would have been unthinkable before: 'I don't know and I don't care twopence. I think this is a bloody awful place. Well, I was fond of it, and I still am really. Someone said to me this morning, "You're a bloody old cow," and I said, "Well, at any rate I can milk a bloody cow, which is more than you can; my granny, who was quite a lady, I may tell you,

correlate, on the depressive side, of the modified forms of mania in the other cases.

Q. 'Are you as interested in things as you used to be?'

A. 'No, I can't experience pleasure to the same extent as I used to.'

That, of course, might not be due to a residuum of illness so much as to some reduction of affect due to operation. So a leading question was put, and in such a way as to imply expectation of a negative answer:

Q. 'You don't feel fundamentally depressed still?'

A. 'Well, I am, yes, but it's having nothing to do.'

This had every appearance of rationalization, so the matter was pursued.

Q. 'Do you feel guilty?'

A. 'Well, it comes into my mind occasionally, it certainly does.'

Q. 'Guilty about what?'

A. 'Well, nothing, only what I told the doctors about before. I do feel that my mind is fixed on myself.'

It seemed that he epitomized, in this simple phrase, what Sands (1947) has described as characteristic of the psychotic depression, 'increasing introspection with narrowed range of thought and repetitive preoccupation with a few ideas.' And, as the patient was referring to his previous depressive content, the very direct question was asked, 'Do you, or do you not, think that your illnesses have been caused by masturbation?' He answered that he did, that he had thought so in the hospital and that he thought so still. Reference to his past notes showed that though this had always been a theme in his depressive phases, on recovery he had formerly been able to emancipate himself from the idea, and on occasion, indeed, had laughed it to scorn. Such a finding now suggested that recovery was incomplete. We might go further, and say—as he said himself—that he was still fundamentally depressed, pathologically preoccupied with his employment difficulty, with feelings of guilt and a persistent depressive delusion. He did not mention these things spontaneously, but did so frankly when asked. Indeed, the difference in the patient before and after operation lay in that fact. The basic and underlying condition remained, but the patient's attitude towards it had been changed. Parallel instances of the same phenomenon can be seen in CASE 72, page 136, CASE 9, page 163, CASE 70, page 165, CASE 57, page 141, CASE 38, page 143, as well as in many obsessional and schizophrenic cases who still retained their underlying conditions.

unspontaneous, would contrast this when invited with her previous state. Twelve months after operation she appeared, in fact, much less depressed; she had more to say, she was less retarded, more active, and for the first time in many years would sew and help in the ward. Eighteen months after operation she was in high mania, singing and screaming, exuberant with great push of talk, and asking her doctor many arch questions about his sex life. Two years after operation she was much the same, but with some querulous hostility, stamping her foot and making imperious gestures if things were not to her liking.

It is a question what part the operation may here have played. One might be tempted to dismiss the change as coincidence. If so, it is strange that it should have appeared so soon after operation, and after 11 years of unvarying monotony. And, as will later be seen, there have been other slow recoveries from depressive states, 1 of which also entered a state of mania.

The sixth of the classically manic-depressive patients neither entered hypomania, nor recovered. He remained depressed in that the basic nucleus of the illness was still post-operatively present, though the outward appearances were very different.

A 57-year-old, partially crippled man had had 7 admissions to mental hospitals in 9 years, all for depressive illnesses which had, however, been punctuated by phases of elation with over-confidence, particularly in response to electrical treatment. Electroplexy had been given during the early weeks of his last attack with just that effect, but he had slipped back into a state of unremitting depression, characterized by profound gloom with suicidal thoughts, hopelessness of recovery, with intense guilt and self-reproach which led to agitated anticipations of early death with ensuing punishment. This had lasted for 10 months before operation. Post-operatively he showed no agitation, and was discharged home within a few months as recovered. But the writer did not consider him so for all his outward normality. From being dishevelled, melancholy, and importunate, he had become spruce, alert, and independent. When asked if he felt cheerful, he said that he did, but the persistence with which he dwelt on the difficulty in finding work that confronted a man of his age and with his physical disability was rather striking. While talking further in this connection, he spontaneously said that he was 'gloomy.' His preoccupation with employment difficulties suggested that this was so, for it was a topic from which he could not be beguiled. One began to wonder whether this was not the

from mid-week to week-end, but even from one day to another, and could climb with rapidity from a trough of depression with diffuse gloom to a pinnacle of hypomania with an infectious gaiety. The other was of special interest in that he showed regularly alternating phases of mania and depression on successive days; on one day he would be silent, withdrawn, taciturn, and dejected, but on the next he would be noisy, shouting and singing, and aggressive, having exchanged a melancholy hopelessness for an excited grandiosity. This alternation was a late development in a long illness, and had become accompanied by mannerisms, strange gestures, and increasingly scattered thinking. Neither patient showed substantial improvement after operation. The former lost his sparkle and his affective warmth, was less imaginative and piquant in conversation, and was far less able to carry others along on the tide of his mounting and irresponsible high spirits, and as his ingenuity and resource in mischief were reduced, so did he gain in trustworthiness and reliability. He remained quietly hypomanic for the most part, with occasional withdrawal into gloom, but while on the whole less aggressive, interfering, and troublesome, he was also less restrained in that he would react to frustration with a readier irritability and more frank abuse. The other patient continued to alternate with the same periodicity from 1 day to another, was more accessible when depressed, less aggressive when grandiose, and far less noisy.

Of the remaining 5 manic-depressive cases, 4 showed anomalous features in the content and behaviour rather than in the periodicity, while the fifth showed them both in the periodicity and the content. One case, already deteriorated before operation, improved only to the extent of being more easily nursed.

CASE 74, a woman of 51, whose father had committed suicide in a post-influenzal depression and 3 of whose 4 sibs had phthisis, while the fourth was schizophrenic, had had 2 attacks of depression after confinements at 24 and 32, followed by a third (without obvious precipitating factor) at 46 which merged into a manic state, and a fourth (after the death of her husband) at 49, which fluctuated into mania and back into depression before ending in a mixed state in which she was noisy, apprehensive, resistive, excited, destructive, violent, doubly incontinent, and for long periods inaccessible to conversational approach to which she replied, if at all, with a farrago

The remaining 2 cases did recover, but 1 of them relapsed. One was a 45-year-old woman whose first breakdown had been at the age of 20, and who had had 9 subsequent admissions to mental hospitals, of which 6 (lasting from a few to 18 months) had been in the 8 years prior to operation. She became fully well, but unfortunately relapsed in the twenty-first post-operative month into a manic state with depressive content, from which she has again recovered. The other case was a man of 32 whose attacks (almost constantly recurring, and nearly always depressive, over a period of 14 years) had only twice demanded hospital care, and over a period of 11 years were compatible with earning his living and with war service. His mood has remained equable over the 2½ years since operation.

In summary, then, we may say of the classically manic-depressive cases, that 1 died through heart failure rather than through operation: that of the 8 survivors, 3 were changed only in so far as their manic tendencies were modified, 2 swung from depression into hypomania (1 of whom settled quickly, but has had mild recurrences since, while the other swung very slowly over a period of 18 months into frank mania which still persisted more than 3 years after operation), 1 showed persistence of his depression though in modified form, and only 2 recovered, of whom 1 later relapsed. Such gilding as is lent to the results by this one sustained recovery is tarnished by the knowledge that his attacks had been anyway mild enough to enable him to earn his living and serve through the war without admission to hospital over a period of 11 years.

In fact, it might seem that in these cases the operation has been of academic interest in providing us with some curious natural phenomena (some possible interpretations of which have been suggested by the author elsewhere (1949)) rather than of practical clinical use. Yet that is not quite so.

There remain 7 patients in the manic-depressive group who did not show the illness in strictly classical form. In 2 of these 7 the anomaly lay mainly in the periodicity. Both were middle-aged men who had long histories of mood disturbance, with sustained phases both of depression and elation, but who showed with passage of time a thymic variation that was more rapid and less prolonged. Thus, one was unpredictable in varying not only

attitudes (sometimes in conscious imitation of historic figures), and occasionally ideas of a fantastic kind, such as that the war might be materially shortened if a particular composer were to write a symphony in honour of the patient's wife.

CASE 25, a 37-year-old woman with negative family history (except that one sister became a nun), basically homosexual, hirsute, with masculine build and distribution of hair, always solitary, introverted, and uncommunicative, but with better social adjustment outside the family, had had to be tided by psycho-analysis over a period of adolescent instability involving philosophic doubts. She had 5 prolonged depressive attacks (with full recovery between) from the age of 27 onwards, until she became a continuous inmate of a mental hospital at 33. The depressive attacks involved low-spiritedness with hopelessness of recovery, self-depreciation and self-reproach, and numerous suicidal attempts, both impulsive and premeditated. They were varied with irregular 12 to 24-hour phases of pleasurable elation with singing from which, however, there were liable to develop wild outbursts with destructiveness and abuse. The patient was liable to warn the nursing staff of the advent of these. Irregularly distributed between these phases of depression and excitement there were 6 to 12-week periods of full normality with insight. The anomalous features lay principally in the sudden and rapid change from one state to another, but also in a tendency to impulsive violence, sometimes directed against herself, which was not quite invariably related to her phases of excitement.

The reader may perhaps agree from these sample cases that the patients showed schizophrenic features in a cyclothymic setting. The operative results were only moderately encouraging. Of these 4 undeteriorated cases, all were well enough to leave hospital after operation, but 2 have shown relapses into modified forms of hypomania, occurring in each case at about 12 months after operation and followed by others, while 1 at least has shown relapse into depression. The mildness of the relapses in these 2 cases can be indicated by the fact that neither patient was obliged to return to hospital, while the family of one of them did not recognize the attack for what it was despite their previous experience. In this latter case the attack was manifested chiefly by increased talkativeness with the introduction of abusiveness and bad language (in which she resembled closely CASE 26, page 127, as well as in that this patient, too, had lost delusions of preg-

of incoherent nonsense. Between previous attacks she had been quite well, but the pre-operative impression of deterioration was maintained post-operatively. From being a frequent dweller in padded rooms, she took to reading, needlework, and amiable conversation, and she no longer needed sedatives. The post-operative kindliness of her nature, however, was riven by occasional sudden quarrelling, and she showed an insidiously progressive deterioration in the form of increasing failure of memory and recognition, so that she came to live for the most part in a state of urbane confusion.

The other cases were not deteriorated, and had also shown complete recovery between previous attacks. None the less, it is proper to state that one of the patients, seen in the same phase by two of the most noted authorities in the land, was diagnosed by both as suffering from paranoid schizophrenia. One of those authorities made the same diagnosis on another of these patients on two separate occasions. But those who saw most of those particular patients took a different view, as did the writer, who had had the advantage of seeing one of them in a previous attack; further, if a long-term view were taken of the history and all attacks were taken into account, there was a trend away from the schizophrenic features towards a more purely manic-depressive condition as time went on. Two sample histories will suffice to indicate the cases.

Case 72 was a 34-year-old man with a family history of manic-depressive attacks in the mother, depressive attacks in the maternal grandmother, chronic and mild depression in a sister, and a schizophrenic first cousin on his mother's side. The patient himself had had 5 prolonged depressive attacks and 3 prolonged manic attacks in 11 years. Always subject to feelings of inadequacy which impaired his social and marital adjustment, he was indecisive but impulsive, while an imbalance between a fundamental aggressiveness and a superficial diffidence was a constant threat to his precarious stability. The two sides of this nature were especially observable in the two types of attack, some of which seemed to be precipitated by these conflicts, while some followed no discernible precipitating cause. The anomalous features were present only in the manic attacks, and consisted in the disproportionately sudden development of excitement with violence (after a premonitory phase of what might be called 'sub-clinical hypomania'), Messianic identifications, discrepant delusions of being poisoned, the adoption of strange

outward abnormality, worked regularly at his former occupation, was equable and thoroughly able to look after himself, though he had unfortunately experienced 4 post-operative attacks of epilepsy. He had, it is true, 'deficits' in initiative and in restraint (in so far as he was markedly irritable at home when tired), while his intellectual range was distinctly diminished. But 'recovery' is still the only apposite word for his present state. (See footnote, page 160.)

Thus, of 2 patients with recurrent manic attacks without depression, 1 died before the result could be assessed, and the mania of the other persisted in modified form. Of 9 classically manic-depressive cases, 1 died from heart failure and 3 were substantially unchanged though the mania was modified. One swung quickly from depression into hypomania, settled, but showed modified hypomanic relapses later. One swung very slowly from depression into a frank mania which has persisted. One has continued, on the other hand, in a prolonged state of mild depression. One recovered but later relapsed. One recovered without relapse, but the attacks had always been exceedingly mild. Of 7 manic-depressive patients with anomalous features, 1 was pre-operatively deteriorated, but was post-operatively more content and easier to nurse. Two were substantially unchanged, but their excitement was modified so that they were easier to look after. Two recovered but relapsed into modified hypomanic states, while 1 of them relapsed into depression as well. Two have shown a sustained recovery, though 1 of them has post-operative epilepsy.

Yet these results are not as bad as they sound. All of these patients, except one, had bad prognoses. Of the cases with recurrent mania, the 73-year-old woman, who died, was becoming, through age and increasing infirmity, increasingly unable to withstand her mania; the other patient was already showing signs of deterioration. Of the 3 classically manic-depressive cases who were substantially unchanged, 1 gained an unexpected year out of hospital, and both the others were easier to nurse, while little, if anything, has been lost for any of them. Of the 2 who swung from depression into mania and hypomania, the former (after 11 years of hopelessness) had already been given up for lost and now enjoys herself far more, while the other, despite her mild hypomanic relapses, has been able to live a life of freedom and

nancy which had formerly been a feature of the attacks) rather than by the development of actual elation or over-activity. Although she was not returned to hospital, her long-standing enmity towards various members of the family became so freely expressed as to render her an intolerable inmate of the household at such times. The family had no idea that the patient had also relapsed into a marked depressive phase over a period of 3 months, and she knew that they had not, though she herself gave of it an excellent and classical account. Just as CASE 19 (pages 130-1) was outwardly normal though inwardly depressed, so did this patient show the same thing in a form much modified compared with her pre-operative states. These findings inevitably raise the question as to how far such relapses into depression may be more common than are supposed, since the patients tend to say little in the way of spontaneous complaint and are able to continue without external abnormality. The other case that relapsed into hypomania showed no evidence of having relapsed also into depression. He did return to hospital within 2 years of operation, not on account of hypomania, but because his family, having removed him from hospital too soon into an atmosphere where he was neither stimulated nor subjected to pressure, began to despair of rehabilitating a lackadaisical personality who had been rendered more so by operation.

Neither of the other 2 patients has shown any tendency to relapse. CASE 25 has become a very flat and calm person, with restricted interests, small spontaneity, and little initiative. It is remarkable to reflect that she is a university graduate who for some time did nursing, so essentially does she display an unanimated rustic phlegm. She works satisfactorily and harmoniously in sheltered circumstances, has shown some increase in animation over the 2½ years since operation, and—whatever she may have lost—has gained much in stability. CASE 72 had a prolonged convalescence with apathy and inertia, and at 6 months after operation complained that he still felt basically depressed. He was withdrawn, uncommunicative, and empty, but in a provocative family situation he was aggressively irritable and became intolerable when tired. He underwent gradual and steady improvement, however, so that at 2 years after operation he was considered fully recovered in that he had neither complaints nor

It is therefore necessary to consider if the small figures at our disposal can offer any indications for the selection of such cases for operative treatment. Discussion of this important point is, however, better deferred until we have also considered the results in the 29 cases who showed recurrent depressions without manic attacks. The matter is reviewed, in the light of these added results, on pages 156-161.

Cases with recurrent depressive illnesses

Of the 29 cases with recurrent depressions, one, a hyperpietic man of 69, died of cerebral haemorrhage almost immediately after operation.

There were 13 cases which more or less resembled each other in that the patients had each had between 1 and 3 previous attacks with many years of freedom between, while the symptoms were diffuse, affecting all levels of function, unremitting and severe. Although 2 of the patients appeared quiet almost to the point of calmness, and a third was stuporose, all were, in fact, given to agitation. All were considered suicidal risks by those who looked after them, and 12 of the 13 were considered suicidal risks by the writer, though the stuporose patient and 1 other had reached a state of bewilderment and incapacity which really had put them beyond the stage where they would have been capable of such a decisive act. Four of them had made suicidal attempts, in fact. The following samples of their conversation will sufficiently illustrate the states of mind.

'Oh, I'm not in good form, I feel so frightfully down. . . . I'm *very* restless, I can't lie still in bed. . . . It came on about 2 years ago, I got a silly idea into my head, I was always thinking about it, couldn't get away from myself, it was whether I could get into the stage where I could lose myself, not really thinking that I would, but the thought—the thought that I might lose all my senses—kept coming into my head. . . . I don't know at times how to bear up against it without some help or assistance. You get to the pitch that you don't know what to do with yourself. . . .'

'I'm only a poor working man and I can't afford operations. . . . Oh, you can see what a weak mortal I am. I'm frightened to death, sir, frightened of everything. Ever since I came in here I can't give you an accurate account of anything, I'm too far gone,

away from hospitals, with much jollity, with riddance of an ominous and appalling depressive illness which had kept her in continual wretchedness. Even the patient who remained depressed exchanged a severe condition for a mild one, with consequent benefits of freedom, relief from much misery, and even occasional enjoyment. The patient who recovered but relapsed enjoyed a remission much longer than she was used to, and the relapse, when it came, was milder, less distressing, and far shorter than its precursors. Of the manic-depressive cases with anomalous features, she who was deteriorated before operation led a life which was post-operatively transformed, until further deterioration reduced it to something which was none the less above its pre-operative level. Of the 2 who were substantially unchanged, 1 had been, anyway, in a disturbed ward for 11 years, and the other, since operation, has been allowed parole. Of the 2 who recovered but relapsed, both are quite well enough to live at large, and they have been enabled not only to recover from attacks of great severity, but have enjoyed remissions more than twice as long as they had previously shown, while the relapses have been so mild as not to have been recognized in one instance, and not to have demanded hospital care in the other. Finally, of the 2 anomalous cases who recovered without relapse, it must be remembered that 1 had been totally incapacitated throughout the greater part of 11 years, and the other had been continuously in a mental hospital for 4 years with repeated interruptions to her career before that, while the prognosis of each might have been considered poor or hopeless.

Viewing the matter in other terms, it can be said that of 18 patients, of whom all but 1 had the most discouraging prognoses, 7 have been returned to life in the outside world, of whom 3 keep house more rather than less satisfactorily, despite post-operative changes and mild relapses; 1 works at his former occupation just as satisfactorily as before, 1 works at his former occupation and maintains himself though less efficiently than before, and 1 works usefully in sheltered circumstances.

We have here, then, a form of treatment which, while in no sense radically curative, is capable of yielding enough in the way of symptomatic relief to make it far from valueless in selected cases of manic-depressive psychosis.

attack) to have a poor prognosis, though the writer did not think so. Three patients had been ill for a year, 2 for between 1 and 2 years, 2 for between 2 and 4 years, 2 for just over 4 years, 1 for 8 years, and 1 for 12 years. The prognosis was considered poor or hopeless in all the cases by those who were looking after them. It was considered poor by the writer in 12 out of the 13. The patients' advisers (and it will be remembered that the writer was merely an outside observer) considered the operation to afford the only real hope of cure in all cases except the patient who had been ill for only 6 months; in him it was considered by the advisers, but not by the writer, a justifiable experiment.

Post-operatively every patient was able to be discharged from hospital, and all have remained continuously at home except CASE 38, who later entered a quiet state of mania of true post-leucotomy form. This development appears to have started mildly in the sixteenth post-operative month, but to have been kept within bounds until the twenty-fourth post-operative month, when readmission to hospital became necessary. Prior to that development his landlady, an intimate friend who had known him for years, regarded him as entirely normal except for a habit of going to bed at 6.30 p.m. for a few hours' reading, with descent for supper at 9 o'clock, after which he would retire for the night. The case is also of interest in that, though post-operatively free from agitation and in many ways improved, the patient did not properly regain his spirits, interest, or freedom from feelings of guilt until 10 months after operation. When post-operatively hypomanic he used bad language, previously quite foreign to him, as did CASE 26, page 127, and CASE 40, page 158, but it is possible that such might have happened in absence of operation, for he had never had a hypomanic attack before.

Of the patients who were continuously able to stay at home, however, 1 was not recovered and showed an interesting phenomenon which was also observed in CASE 9, page 163, and in CASE 91, page 373, in that an outward appearance of euphoria did not correspond with what the patient inwardly experienced, and was recognized by her as being incongruous but beyond control.

CASE 57, a married woman of 60, had had 2 previous attacks of depression, each lasting several months, at 24 and at 29. The last,

sir, . . . I haven't the least interest in anything. The world in general and the way everything is going is black. I'm too old to work now. They've done everything to get me to take an interest, taken me out in a bus and shown me things, but I can't think of anything but the trouble and worry in my mind. Goodness gracious, look at me, look here, this weakness (*rubbing his forearms violently*), I should never have picked this up at my age. . . . I couldn't keep quiet, gave them no peace, nattering Nan I call it, pacing about, talking, it's all been brought on by my fault, kiddishness, bloody sprucers; oh, dear, oh, dear, I'm like a rat in a trap. . . .'

'I don't feel like I used to, years ago, like when I went out to do my shopping. I don't want to, don't want to go out, I don't want to meet people. I sit looking in front of me all the time, thinking and thinking, thinking of the days gone by. I wish I was like I was years and years ago, well, it seems years and years: it's about 4 years since I began to think this. . . . It's all this lack of interest, if only I could get interested and go out and do my shopping. I used not to be like it, or did I? Is that a delusion? Oh, I'm glad you think I'm different. . . . I feel guilty now, yet I don't know what I've done, I can't have committed those crimes. . . .'

And one woman, agitated almost beyond speech, muttered between groans, 'I'll tell you the truth, doctor, as I've told it to the other doctors, I can't do more . . . oh, I'm so terribly frightened . . . oh, I've got into this place, it's all my fault, and I shall never get out . . .'; and after long persuasion she revealed in a terrified whisper that when admitted she hadn't been ill, but, silly and weak-minded, she was a fraud. 'I put it to you, doctor,' she finally mustered herself to say with desperate earnestness, 'wouldn't you worry if you had that on your conscience?'

One patient had been ill only 6 weeks. He was an 81-year-old man, desperately suicidal, with a history of determined suicidal attempts in 2 previous attacks. He had shown no improvement in hospital, and had made no response to electroplexy. His advisers decided (correctly, as it turned out) that his last days might be made rapidly more tolerable by operation. Another patient had been ill only 6 months, had failed to respond more than transiently to electroplexy, and was considered (in view of a long previous

slightly more active and interested, would be taken out to have her hair done, had visited the grandchild, would remark, though without conviction, that she would like to see the comedians at the vaudeville, would very occasionally help to wash up, and had controlled her incontinence. But at interviews she showed no Puckishness. She wept and snivelled, saying she didn't want to see anyone from the hospital and was afraid of being taken back there. She sat, bursting out of her seams ('Better to fill the coffin than to roll about in it,' she had replied to some remark about her weight), mewling with averted eyes. When roused by a series of gentle challenges, she began to laugh in an automatic way, and said she laughed too much, and at things that were not funny. She said—to the family's incredulous surprise—that she was not happy, could not feel pleasure, had no feelings of enjoyment. She said she was too old, would like to die, wished she were dead. Later, in reference to some future event, she said she hoped she wouldn't be alive by then and believed she wouldn't be. The family were inclined to treat these remarks as a sort of affectation; but to the observer they rang true enough. The picture is so closely similar to that of CASE 9, though without the same improvement, and is reminiscent of the observations of Mixter, Tillotson, and Wies (1941) on 2 cases of agitated depression: 'The psychosis is not "cured" but an affective "de-sensitization" seems to take place. . . .' In fact, the underlying condition seems to have remained, but the patient's attitude towards it was quite different. Two years after operation she was virtually the same.

Two other patients, ill for rather more than 8 and 4 years respectively, also showed persistence of depressive symptoms after operation. In the former these lasted for over a year, and in the latter for more than 6 months, in the form of lack of interest, enthusiasm, and affection, with a mood that, if not downright sad, was certainly far from cheerful, with a wistful yearning to get better in one case, and was one of positive gloom in the other. Both fully recovered. There are thus (including CASE 38, who felt disinterested, guilty, and low-spirited for 10 months before a recovery which was followed by hypomania, and CASE 57, who showed a seeming euphoria which did not harmonize with her inner feelings) 4 patients who showed persistent post-operative depression despite some immediate improvement.

The 81-year-old man showed some affective lability after

and third attack, had started in 1934 at the age of 48. Apart from excellent but very brief remissions evoked by electroplexy, this had continued unchanged (characterized at onset by blaming herself for her daughter's scarlet fever, looking for germs round the house, cleaning things unnecessarily, and then after a week or two by steady self-blame with guilt and fears that the worst was going to happen, feelings that people criticized and laughed at her, indecisiveness and lack of interest) until she began to deteriorate in 1946, when she became almost mute, neglectful of hygiene, faulty in habits, and finally inaccessible and stuporose.

Four and a half months after operation she was home, but strangely changed. Previously active, her activity was minimal: previously thoughtful, she was entirely selfish: previously reserved, she was grossly outspoken: previously cautious and calculating, now she did not stop to count the cost. Thus, after being urged to wash or forced to bath, she would get down at 10 a.m. and potter aimlessly: saying she had worked hard all her life and the others could do it now, she left housework and cooking to her husband; in the afternoon she had a nap; in the evening she leafed through the paper, *listened to the wireless, and went to bed early.* She hardly ever went out, and when she did only by taxi. She was very unspontaneous; though she retained executant ability on the piano, she would play only on request and would then tease the audience by breaking into 'Three Blind Mice.' She seldom spoke spontaneously, but when stimulated she would make sharp sallies saved from downright nastiness only by a giggling and Puckish demeanour. Her mood had every appearance of euphoria and she giggled often: occasionally she would vary her inactivity by dancing with skirts round her waist, but only for a short time. Her only interest was eating, which she did grossly, so that the larder had to be locked. In trying to circumvent this she showed a sprightly Puckishness, as when on another occasion she snatched some money which one relative was paying to another and never yielded it up. She had a certain insight in that after some piece of unconventional behaviour she would say she wondered what other people thought of her; but it was clear that she didn't mind what they thought in the least. There was one exception: she refused to attend a grandchild's christening because she said she would laugh in the church and would be turned out. She was quite disinterested in the grandchild, and had refused to go 3 miles to see it, saying, 'What, all that way? Not likely, it can wait' She showed a similar nonchalance over being incontinent of urine. A year after operation she was very

were intelligible in terms purely of psycho-dynamics, many of them had also what we may call an 'endogenous stamp,' in that she showed anergia, with anorexia, a diffuse glumness with lack of reactivity, loss of interest and feeling, with indecisiveness and early waking, while feelings of unworthiness were often a prominent feature. CASE 85, aged 62, had had 12 depressions of classical kind in 7 years. CASE 44, aged 53, had had her first attack in 1917, her second in 1937, and 4 more between 1942 and 1947. CASE 24 had had 9 attacks in 9 years, and CASE 69 had had 6 attacks in 8 years.

Post-operatively CASE 83, the 69-year-old woman who had had repeated brief spells of agitated depression and was under hospital care for 17 years on that account, showed the least successful result. The operation had been decided on partly because she showed increasingly poor response to electroplexy, and partly because such treatment carried increasing hazard owing to age, chronic bronchitis, more prolonged cyanosis, and longer delay in recovery from the shocks. After operation the patient lost her tendency to excitability and to agitation, she was less hypochondriacal and histrionic, and though she had traces of guilt feelings (not entirely without foundation in reality), she did not feel actually depressed. She was, however, extremely inert and apathetic, needed much stimulation before she would bathe or get up from bed, was snappish and sarcastic to the point of being quite unpleasant, and was noticeably paranoid. It is probable that this last arose from a post-operatively freer expression of what had actually long been in her mind. It had never been intended that she should leave hospital, for she had nowhere to go and was ill adapted to life outside an institution; she became well enough to go away for week-ends as she had before, but in the tenth post-operative month she became increasingly inert, followed by drowsiness and confusion which led to a coma from which she never emerged. The cause of death, despite autopsy, remained uncertain, though having a clinical resemblance to uraemia. The brain, examined by Meyer and McLardy (1948), gave no incontrovertible evidence as to the cause, but it is thought probable that this may be one of those cases where interference with autonomic regulation has been conducive to a failure of the bodily defences.

operation, with a good deal of grumbling at his failing strength, occasional incontinence, and some ill temper with unkind abuse at home. The picture was complicated, however, by senile changes. He resumed his activities to a surprising extent, ceased to be incontinent after 6 months, by 12 months was much more amenable, and by 2 years was again a regular walker and church-goer who, though difficult in the way that old people sometimes are, no longer used bad language or was abusive.

The other patients resumed their previous lives entirely. Thus, out of 13 severely and persistently depressed patients of whom the prognosis for 12 was thought to be poor, 1 was well enough for discharge (though not in any sense recovered and a source of some difficulty in the home) after a 12-year illness, another recovered fully, though slowly, and returned to work after an 8-year illness, 2 did the same after an illness of more than 4 years' duration (1 of whom made a slow recovery, but the other did not), and in all, 12 out of the 13 patients resumed their previous lives, though 1 of them later relapsed into mania.

Next we must consider a sub-group of 7 patients in whom the symptoms were on the whole milder, and who had had repeated attacks with briefer remissions between. CASE 83 was a 69-year-old woman who had been under hospital care since the age of 52; although 17 years before she had been stated vaguely to 'have a manic-depressive background,' she had not within living memory at the hospital shown any positively manic features, but she had had repeated attacks of agitated depression lasting from a few days to a few weeks, and recurring so often that she had never left the building for more than a week at a time. CASE 68, a man of 66, had worn his private doctor to a shadow, and had had 2 admissions to mental hospitals in the course of 15 years of recurrent depressions, which followed each other so rapidly that he would have only a few weeks of remission between attacks. His family history was remarkable in that of 5 sibs, 2 had died in mental hospitals at the ages of 18 and 19, 1 had drowned himself at 30, and another had shot himself at 55, while a maternal first cousin had died in a mental hospital also. CASE 43, aged 39, had had repeated depressive attacks, often masquerading as physical illnesses, for 17 years, and therefore too many to count. Though there was a hysterical colouring, and though many of the attacks

Of 7 patients with, on the whole, less severe but far more rapidly recurrent depressions with only brief remissions between, 1, though she lost her depression, became post-operatively a more awkward and tiresome person before dying from obscure causes in the tenth post-operative month. The other 6 all recovered from their depressions also, were discharged from hospital, resumed their former lives more rather than less fully, and have not relapsed. But the effect of sudden disinhibition on a grossly introverted and inhibited personality led 1 patient into social difficulties, while some lack of restraint has caused 3 others to have their disagreeable aspects.

There remain 8 more cases with recurrent depressions. These were all quite different from the foregoing. Four of them were strange illnesses which verged on the bizarre, while 3 of those 4 contained also marked obsessional elements.

CASE 56, a slightly obsessive but tough-minded woman of 49 (with negative family history), had had a depressive spell lasting a few months at 37, following the death of a child; she overcame this by turning towards religion in quite a practical sort of way; at 38 she had had a second spell, in which she was obsessed by the fear that the surviving son was dying, was unable to accept reassurance, needed someone constantly with her, could talk only about herself and of wicked thoughts of violence for which she felt sure God would punish her. She recovered after 3 months in a mental hospital. At 47 she had a third attack of acute onset; she had feelings of guilt which she stated to be irrational; she was depressed and worried by compulsive thoughts which urged her to commit acts of violence and which were also expressed in the form of voices which she said she heard distinctly in clear consciousness. They urged her to gouge her eyes out and to commit suicide, to burn the child and gouge his eyes out, to kill the nursing staff of the hospital, to assault other patients and their relatives. She never acted on these promptings, though she said she got near to smashing things and would have liked to do so. She saw visual images (which had no qualities of reality) of murders, graveyards, and funerals. She became increasingly obsessive, seemingly as a substitution for these thoughts and images and as a precaution against their realization, and markedly self-absorbed with a prevailing depressive mood sometimes exacerbated into an agitated tearfulness. There was reactivity to the extent that she could be persuaded out of tearfulness and by determination could temporarily lose the auditory hallucina-

The other 6 of these 7 cases with rapidly recurrent depressions all lost their symptoms, returned home, and resumed their former lives, but the lack of restraint shown by 1 of them had unfortunate results.

CASE 43, aged 39, with repeated attacks occurring over 17 years, with hysterical colouring but with a fundamental genuineness, had always been a feeble, vacillating woman, teeming with conflicts, but impelled by a morbid fear of doing the wrong thing and by an over-anxiety to please. Post-operatively she lost her depression and with it many of her inhibitions. It appeared that it was by these that she had mainly been held together. She did not mind if she pleased people or not, and her fears were enormously reduced, so that when she realized she did not like her landlady she told her so, and she threw up 3 successive jobs because they did not fully fit her specification. This freedom from restraining forces allowed her to fall in love for the first time. Unfortunately, she chose a young married doctor at the hospital, outside which, as well as outside his house, she hung about with beating heart on the off-chance of seeing him. Concerning him she developed also undisguisedly sexual dreams, which she alleged to be quite foreign to anything in her previous waking or sleeping experience. She entered a love-lorn and moody state, as a result of which she was irritable, capricious, inconsiderate to others, and generally dissatisfied. Her sister, with whom she had lived since the rupture with her landlady, found her difficult to manage. She could not concentrate on any work, and entered a flurry of frustrated discontent. She did not become depressed in the same sense as she had previously, but the difficulty of putting up with such a person in the home finally led to her admission to a mental hospital for a short while as a voluntary patient. She pulled herself together to some extent in that neutral environment, returned to the outer world, but has since been working capriciously and erratically, and has continued her attachment, so that she is bringing the poor young man to an early grave by importunate letters, histrionic demonstrations, and other devices designed to gain sympathetic attention.

At this point we may recapitulate. Of 13 patients with severe recurrent depressions of long duration, with long remissions between, all were discharged home. Twelve of them were recovered, though in 3 of those 12 depressive symptoms persisted for some time after operation in less obvious form. All 12 have maintained their full recovery except 1, who relapsed into mania.

over-scrupulously, though without being ritualistic about it. Nine years later, at the age of 40, she was readmitted to hospital with a further recurrence. She was depressed, agitated, caught up in obsessional thoughts which caused her to go over and over conversations that she had had, while items that she saw in advertisements, or casual remarks, would repeatedly enter her mind as before. The name of a bakery advertised in the morning paper, 'the nucleus,' 'files,' 'boracic powder'—almost anything would come into her thoughts and, after vexacious repetitions, be replaced by something else. She ate poorly, had difficulty in getting off to sleep, with early waking, and had many sexually symbolic dreams; in the daytime she was interested in nothing but her own state of mind and how to escape from it, and could hardly muster herself to attend to anything else. She responded transiently to each of 8 treatments by electroplexy, with disappearance of the obsessive-compulsive features. But the improvement lasted only a few days at a time. After this recurrence had lasted for 12 months, operation was decided upon. Both the depression and the obsessive-compulsive condition disappeared forthwith. When seen 6 months after operation the patient was declared by herself and her relatives to be 'better than for about 20 years.' She had small personality changes in the way of reduction of energy and interest, with less warmth of affection and less highbrow tastes, and was very unspontaneous; but she kept house admirably, behaved impeccably towards her relatives, and did all that was required of her. When seen rather more than a year after operation there was considerable spontaneity, with much humour. She had taken a job, but had willingly reduced it to part time in order to look after 2 grown nephews who had come to live in the house. She had resumed her social life, as well as singing and playing the piano. She had bought and learned a number of new songs, and she had acquired a new set of teeth on her own initiative and the national health service. But she read seldom, nor did she know any item of general news or feel any interest in it—in contrast to her family and her own previous habits. As against this, she never lost her temper, was very easy to get on with, and was considered happier and on better terms with life than she had ever been before. Owing to distance she has not been seen since, but correspondence shows her to have maintained her well-being.

The third case with obsessional features was somewhat similar, in that these last occurred in association with long depressive phases, accompanied by an importunate agitation. There were compulsive features which involved almost every activity of the

tions and compulsive thoughts by energetic application to other trains of thought, but this was not always so, and the depression was prevalent and never lifted. After 6 months she made some degree of recovery and returned home, but at once relapsed entirely, again improved somewhat after 4 months in hospital, returned home and relapsed entirely, and was operated on (electroplexy, psychotherapy, and supportive measures having failed to relieve her) when the condition had been present for 18 months. She recovered quickly from her depression, but her compulsive thoughts, hallucinatory and otherwise, continued for about 8 months after operation, though exerting no dominant effect.

CASE 16, a single woman of 40, was rigid, meticulous, and ruminative, but not given to obsessive rituals. She was the youngest of 6 'highly-strung' sibs, and her father had had two mild depressive illnesses from which he had recovered without hospital care. She was ill-adjusted in that she yearned for a career, but had neither training nor special bent, was emotionally inhibited and over-intellectual, had never shown interest in men, and held a grudge against life because she had found herself left at home and obliged to look after an elderly mother. This state of affairs was already established when, at the age of 24, she had a phase of depression with lowered energy and spirits, restlessness, some difficulty in sleeping, and the repeated intrusion into her mind and against her will of the number 79. After about 18 months she spontaneously recovered, but 2 years later, at the age of 26, there was a further attack as a result of which she felt so distressed and perplexed that she entered a mental hospital. Apart from the number 79, she was then bothered by the number 97, but there also came into her mind repeatedly, unbidden and unwelcome, words and sentences. 'Rise and claim the victory.' 'The cathedral at Amiens.' 'Sahara.' The psychodynamics were never understood, and if the original phrase had had any significance, this must have become obscured by the number of others with which it became replaced. 'Scandinavia,' 'Polytechnic,' 'Helter-skelter,' and anything that she saw by chance, or any words that she overheard might be used as a substitute for former ones. As the condition dragged on the depression deepened, accompanied by agitation, suicidal thoughts, accesses of wild despair, and chronic indecisiveness. Heavy sedation led to temporary improvement, and its withdrawal to inevitable relapse. After 4 years and 9 months she became much better, for no very apparent reason She continued to live at home with her mother, and she remained well except that she would have occasional bouts of bad temper, and kept the house

depressive one, though with anomalous features. She was operated on within 9 months of admission, all other treatments having failed to change her, and was discharged recovered 4 months later. The illness was of a form which seemed little related to the life situation in which it had developed, and of a severity quite disproportionate to the apparent precipitating causes. The patient has managed perfectly well since her return home and has been in no conflict although the same family problem exists which troubled her before. She has no insight into nor understanding of her illness at all. The latter appeared to be an autonomous condition though precipitated by situational factors, one of which was influenza.

Thus, in addition to our 13 cases with prolonged and severe depressions but with long remissions between, and our 7 cases who had had repeated attacks with brief remissions between, there have been 4 cases whose depressions have shown features verging on the bizarre. Three of these 4 cases have shown obsessive-compulsive symptoms, and the fourth schizophrenic features, in the depressive attacks which brought them to operation. All 4 recovered.

We are left with 4 final cases who showed recurrent depressions. Just as the last 4 cases we have considered, with their atypical features, seemed quite different from any that had gone before, so did these 4 final cases seem different from all the rest.

They were all 4 chronically inadequate people with a tendency to hysterical reactions: all were immature, dependent, dissatisfied with themselves, and the more so because they had talents beyond the ordinary. Because it seemed a part of their nature to feel misgiving, and because experience had made them aware of their deficiencies, they were more or less constantly expectant of misfortune. The illnesses seemed clearly related to their dissatisfactions and their fears; both the symptoms which they showed and the course which they followed could be so interpreted without straining the facts. It was thus hard to differentiate between the 'illness' and their normal state, to distinguish between where the personality ended and the morbidity began, so insensibly did they merge into each other, and so readily, in situations of difficulty, did the patients accept rather than resist the symptoms.

Of these 4 cases, 1 has not left hospital after operation. Having

patient's life, and, if he were not sure if he had had cod or hake for lunch, he was obliged to walk along the passage to ask the cook, sometimes several times. He was much preoccupied with some adolescent thoughts of bestiality which played havoc with a powerful conscience, though they were an episode of many years ago; and connected with this he was obsessed by fears, which could be fired off by almost any stimulus and which overpowered him, that he might be turned into a horse or a dog. The symptoms, both affective and obsessive-compulsive, were almost entirely removed by operation. The patient resumed his work satisfactorily, was married within 6 months, and was considered by his relatives to be entirely well, though less worrisome, at 18 months after operation when the case was last followed.

The fourth of the recurrent depressive cases with features verging on the bizarre showed schizophrenic rather than obsessive-compulsive traits.

CASE 66, a woman of 46 (with history of recurrent depressive attacks in 1 brother), had had 2 minor breakdowns at 17 and 21, one following the death of a favourite brother, the other following a conflict over an engagement; a holiday was considered advisable each time, but she was not in hospital. At 45, while still distressed by the death of her father in circumstances which had made a great impression on her, she was thrown into conflict by a major family disagreement in course of which she developed influenza while having to nurse her husband and son for the same complaint. She became markedly depressed, which state was exacerbated by a series of minor inconveniences, culminating in the departure of her only servant. She became sleepless, increasingly worried and depressed, and then suicidal, was given 1 treatment by electroplexy as an out-patient, after which she became violently suicidal and antagonistic, disorientated and confused, had to be held down for 6 hours, and was admitted to hospital, where she pursued a very variable course. Some days she would be preoccupied, harassed, tense, saying loudly that she must end her life and making approaches to the windows. Other days she would be almost mute, destructive, restless, suddenly laughing wildly, or replying to questions irrelevantly and incoherently. She was in general apprehensive, would say that she was in hell, and was often tearful. All her remarks had a depressive colouring. The illness was considered an essentially

psycho-analysis. After operation she returned to her former firm and resumed secretarial work, but was very jealous of a girl who had been promoted in the meantime and under whom she had to work. Her self-consciousness, feelings of misgiving, and concern over the future were still present, though much reduced. Her confidence was increased, and she was more outspoken and decisive; her friends described her as 'cocky'—an unthinkable epithet before operation. Friction and difficulties developed at her work, she began to feel that she did not receive due recognition for her abilities, that her colleagues and employers tended to slight her in oblique ways, that they made sly references to her previous breakdowns, and tried to humiliate her. She became quite convinced that they were in league to make her as uncomfortable as possible, but was unable to decide whether this was to get rid of her, or done to test how far her personality had increased in robustness since the operation. She inclined to the latter view, which was strengthened by a number of small coincidences which led her to suppose that the office staff knew far more of the details of her illnesses and personal history than she had realized. She thus found herself the centre of a sort of bureau of investigation in which the work-fellows were collaborating with the medical profession. A general loosening of her thought processes in this way was apparent in many directions. She became hostile and difficult to manage and was readmitted to hospital, where her hostility further increased. She was taken away by relatives against advice. These, with great courage and patience, undertook her care, treating her in an intuitive sort of way by reassurance, encouragement, persuasion, and moral support. Notwithstanding the fact that she was deluded, filled with ideas of reference (and carried things to the extent of believing that a man was named OATS in order to remind her that she had not made success of a job in the A.T.S.), they restored her to calm. Her delusions and ideas of reference gradually dropped out, she became tranquil, amenable, and friendly, though never grateful, decided that she must regain her independence, and left the care of her relatives to take up a clerical post in which she has worked successfully since.

Now, scrutiny of the history culled from 5 hospitals showed only 2 isolated items which, viewed in the light of these subsequent developments, had anything of a true paranoid flavour. But there had been a notable tendency in the patient, dissatisfied with herself and acutely aware of her own inadequacies, to show some resentment at the success of others: she had been envious of the married and settled state of her sisters, and had even quarrelled with

started his working life as a company director, which he never felt to be his *métier*, he had turned to art in which he achieved distinction but never felt that he had fulfilled himself. Inhibited, with no power of social adaptation, self-critical, feeling inferior but inwardly ambitious, vexed with himself and at odds with the world, he would take revenge on his brothers, later on his wife and son, by cruel and aggressive behaviour designed to relieve his feelings and to give himself a sense of superior adaptation. But he would then despise himself for having done so, though, rather than make amends, he would wallow in self-pity. Torn by egocentric conflicts, he would from time to time throw himself upon others to be 'cured.' After a suicidal attempt at 59 he was finally operated upon, since when he has been equable, free from dissatisfaction and self-reproach. He shows a sudden and short-lived irritability in response to any irksome demand made upon him, but that is easily managed by those who do not arouse in him any old and deep hostilities. He enjoys parole, works hard, and is given special scope for high artistic talents. He is retained in hospital because he tolerates it well, because his family have grown used to being without him, and because his irritability would render him an uncertain quantity among those with whom he has tended for many years to quarrel. His freedom from unhappiness and tormenting thoughts represent to him an enormous gain. The other 3 patients returned to the world and resumed their lives; 1 of them runs a guest-house as well as bringing up a family, though she does it with her husband's help. But one needs special note, for, after leaving hospital, she passed through a paranoid phase, indeed an episode which might be considered schizophrenic with paranoid colouring, so far did she become separated from reality in her interpretations of events.

Case 22, a woman of 41, inadequate, immature, dependent, and wistfully envious of the success of others with less intellectual endowment than herself, with a tendency to shrink from difficulty and from men, had had 6 depressive episodes, between which she would remain well though perpetually harassed by vague fears for her future engendered by her feelings of inadequacy, her single state, and her tendency to get easily worried. For 4 of these episodes she had been in hospital, where she had treatment with cardiazol and ECT. and extensive psycho-therapy as well as 2 years of

corpse she had found: these indicated that much more of her past than she had realized was known to other people, who were thus emphasizing by these oblique references the fact that she was an inadequate person liable to frequent breakdown. She became convinced with these improbabilities, and having accepted the first ones, she had little difficulty in accepting further ones as they came along.

The question is whether this looseness of thinking, which she had never shown before, and of which there was no family history, was facilitated by the operation. Could it be that in the absence or reduction of that timidity and cautious deliberation which had previously marked her judgments, she leaped to conclusions that cogitation had formerly enabled her to avoid? And could it be that the arrival at such hasty conclusions was facilitated by the post-operative reduction in the number of associational pathways, the pre-operative plenitude of which, by leading to elaboration and restrained reconsideration of such judgments, had enabled her to avoid falling into hasty errors of this kind? This is a pure speculation. But the post-operative development of a paranoid state of this floridness in a person not previously subject to it, apparently situationally determined and clearing up on removal from the situation, the whole occurring in the absence of actual depression of mood (with which she had always reacted to situations before), demands some explanation. It is noteworthy that the patient's hostility, and with it her paranoid ideas, continued on return to hospital; the return to hospital underlined her failure further and so maintained her hostility; the removal by relatives and the fact, in the initial stages, of being under their observation and supervision increased her sense of dependence and therefore her resentment for a time, but as she had full freedom and, through skilful handling, was provided with no cause for further resentment, the hostility gradually diminished. To the last she was convinced that the state of affairs in the office where she had worked had been as she believed it, but in the more tranquil atmosphere which the relatives were able to provide, the subsidence of her hostility enabled her to live without development of new delusions.

Thus, of our final 4 recurrently depressive cases (whose illnesses seemed hardly more than an extension of their natural personality traits), all 4 recovered, though circumstances rendered retention in hospital preferable for 1, and another went through a post-operative paranoid phase with recovery.

her favourite one who had to some extent, through marrying, transferred her affection from the patient to husband and children. There was thus material available in her pattern of reaction for a possible paranoid development. The post-operative situation was also to some extent propitious for that: her employers had become interested in her welfare, had played a part in arranging her admission to hospital, her transfer to another hospital where they paid the fees, and in contributing to the costs of operation, while they also kept her job open against her return. It was not unnatural, therefore, with her self-consciousness, which was still marked (though reduced) after the operation, that she might feel herself scrutinized by them in the way that a firm may scrutinize the progress of its investments. And to that extent it was not unnatural for her to feel herself in a test situation. Further, the operation represented to her a dramatic crisis, through which her personality was to be changed from inadequate to adequate, and this was to her a difficulty in that she did not know how much the change was to be automatic and involuntary, or how much it was to be brought about by her own efforts; she was bound, therefore, to scrutinize herself and to experiment in a self-questioning way. This was the more so as the sweeping personality change which she had anticipated did not occur; she found she was her old self with some minor modifications. The operation was thus something of a disappointment, if not a downright failure, and the question arose: If it was a failure, was that the fault of those who contrived it, or was it her own fault for not responding better? Thus did she anxiously question herself in her test situation.

As, moreover, after her absence in hospital she had more difficulty in picking up the threads of her work than she expected, and as she was not restored to the full position of responsibility which she felt was her right, and as she came to experience an acute dislike of a girl under whom she had to work, it was not unnatural for a sense of failure to grow apace. The sense of failure, in its turn, roused some feeling of hostility at the success of others. As she was rather less restrained than pre-operatively, she let some of this hostility appear; this led to some rows in the office. She concluded that people who had rows with her were hostile to her, and from that, that the office staff were against her. Thus far it was more a matter of feeling than of reason. Reason was introduced, in a somewhat hasty fashion, to rationalize the feeling. There appeared in the correspondence with which she had to deal various names; some were names of people whom she had known in hospital, one was that of a suicide whose

pse she had found; these indicated that much more of her past
n she had realized was known to other people, who were thus
phasizing by these oblique references the fact that she was an
dequate person liable to frequent breakdown. She became con-
ced with these improbabilities, and having accepted the first ones,
had little difficulty in accepting further ones as they came along.
The question is whether this looseness of thinking, which she had
ver shown before, and of which there was no family history, was
ilitated by the operation. Could it be that in the absence or
luction of that timidity and cautious deliberation which had
eviously marked her judgments, she leaped to conclusions that
gitation had formerly enabled her to avoid? And could it be that
e arrival at such hasty conclusions was facilitated by the post-
erative reduction in the number of associational pathways, the
e-operative plenitude of which, by leading to elaboration and
trained reconsideration of such judgments, had enabled her to
oid falling into hasty errors of this kind? This is a pure specula-
on. But the post-operative development of a paranoid state of this
rbidness in a person not previously subject to it, apparently situa-
onally determined and clearing up on removal from the situation,
e whole occurring in the absence of actual depression of mood
vith which she had always reacted to situations before), demands
me explanation. It is noteworthy that the patient's hostility, and
ith it her paranoid ideas, continued on return to hospital; the
turn to hospital underlined her failure further and so maintained
er hostility; the removal by relatives and the fact, in the initial
ages, of being under their observation and supervision increased
er sense of dependence and therefore her resentment for a time,
ut as she had full freedom and, through skilful handling, was
rovided with no cause for further resentment, the hostility gradu-
lly diminished. To the last she was convinced that the state of
ffairs in the office where she had worked had been as she believed
t, but in the more tranquil atmosphere which the relatives were
ble to provide, the subsidence of her hostility enabled her to live
without development of new delusions.

Thus, of our final 4 recurrently depressive cases (whose
nesses seemed hardly more than an extension of their natural
rsonality traits), all 4 recovered, though circumstances rendered
tention in hospital preferable for 1, and another went through
post-operative paranoid phase with recovery.

Review of the cases with recurrent affective disorders

At this point we may recapitulate and examine the findings in the hope of arriving at some general conclusions.

There were 47 cases of recurrent affective disorders.

There were 5 deaths, 2 from cerebral haemorrhage in hyperpietic patients, 2 from obscure causes probably related to operation, occurring in the third and tenth post-operative months respectively. The fifth was from heart failure, and was not considered attributable to the actual surgery.

Forty-four cases survived long enough for observation, of whom 26 were women and 18 were men. The women did slightly better than the men in that 18/26 showed sustained recoveries, as against 10/18. In addition, 4 out of 26 women recovered but relapsed, as against 3 out of 18 men.

The age at which the first attack occurred seemed of no significance in actual post-operative recovery, but the figures suggested that the earlier in life the attacks had begun, the greater was the chance of post-operative relapse. Thus, of 12 patients who first became ill when over 40, 9 recovered of whom 1 relapsed. Of 17 who first became ill between 25 and 40, 14 recovered of whom 2 relapsed. Of 15 who first became ill before the age of 25, 12 recovered of whom 4 relapsed.

The frequency with which patients showed pre-operative recurrences seemed of no significance in post-operative recovery or relapse, as long as there had been remissions of good quality between recurrences. Thus, of 21 patients with infrequently recurring illnesses, 14 showed sustained recovery, and 3 showed recovery followed by relapse. Of 20 patients with frequently recurring illnesses, 14 showed sustained recovery, and 4 showed recovery followed by relapse. But of 3 patients in whom the alternations from mania or hypomania to depression and back again had become actually continuous, none recovered and all showed persistence of their states in modified form.

The actual duration of the single attack, likewise, appeared to influence the outcome: in that of 35 patients whose attacks had lasted less than 3 years by the time of operation, no fewer than 32 recovered (though it is true that 7 of them relapsed), whereas

of 9 patients who had been continuously ill for longer than 3 years, only 3 recovered.

There was no correlation between recovery and age at the time of operation.

The presence of manic features seemed to be an ominous item, whether or not the patients were operated on in a manic phase. Thus (1) the only patient to survive operation who had shown recurrent manic attacks without depressive ones, persisted in his mania though in modified form. (2) Of 9 classically manic-depressive cases, 3 were handicapped by persistence or recurrence of their manic phases, though modified, to the extent that retention in or return to hospital was necessary. (3) Of the other 6 classically manic-depressive cases, 1 (who had before shown nothing beyond phases of over-activity) swung slowly into frank mania over a period of 18 months after operation, and 3 others relapsed into hypomanic states. (4) Of 6 manic-depressive cases with anomalous features, the manic features in 2 were modified, yet comparatively little affected, while a third relapsed on different occasions both into depression and into hypomania. (5) One case with recurrent depressions, who had never before shown manic features, relapsed into a modified mania. That is, 2 cases showed mania for the first time after operation, 4 cases persisted in it, and 3 others relapsed into it. In fact, of the 7 relapses, 5 patients relapsed into mania, while 1 relapsed into both mania and depression on separate occasions; while a seventh gradually became manic over a long period after the operation.

Comparing this with the depressive correlates, a depressive state persisted post-operatively in 4 patients, and was resolved in 3 without subsequent relapse, while 2 patients relapsed into it, of whom 1 had relapsed into hypomania as well.

It would appear, therefore, that the operation does not fully control either phase of manic-depressive psychosis, but that the manic elements are less easily held in check than the depressive.

In this connection, however, attention is drawn to the great difficulty in recognizing post-leucotomy hypomanic or depressive states as such. As far as post-operative hypomanic reactions are concerned, we have already seen that the family of CASE 40 did not recognize these when they occurred; the same is true of CASE 54, though they were recognized by the family physician who had

much psychiatric experience; the same is true of CASE 17, who was recognized as hypomanic only on attendance at psychiatric outpatients; the hypomania of CASE 38 (see page 141) was not recognized by his landlady, who knew him well, as anything seriously out of the way until he became frankly manic 8 months later. Thus, the general public, usually quick, with robust good sense, to feel that something is amiss, do not recognize these states as pathological. The most astute clinicians may perhaps be able to do so, but the author, when confronted with the doubtful case, confesses to uncertainty. CASE 213, page 260, is one in point. More illustrative is CASE 40. But here the writer has the advantage of being socially acquainted, to some extent, with the patient's family. Thus familiar with the background, he was able to recognize—which the family and the local doctor were not—that when, on one occasion, the patient met a long lost sister (whom she disliked) in a conventional way, but later on greeted her return with the words, 'Oh, you're here again, are you, you bloody bitch?' there was a difference between the affective states on the two occasions greater than could be accounted for by any everyday irritability. On the latter the patient had been more talkative than on the former, though (through post-operative reduction) not as much so as one associates with hypomania, while there had been some, but not much, increase of activity, with diminution of sleep. Consider also the pressure implicit in the following letters, written during a later post-operatively modified hypomanic phase, when it is borne in mind that the patient was shy, was not accustomed to write to the present author, and had never done so before.

DEAR MAURICE,

May I call you that? I have anyway! It was charming seeing you last Sunday. I should have said that I got excited the moment I saw your grey car! Do you believe me?! How are you keeping? Less of a paunch I hope![1] There is a sister here, Perkins by name, who trained at Bognor and seems to know your name. I'm glad you're famous! Have you painted any more pictures? I hope so. That Irish psychiatrist, Dr. O'Grady, said recently that if I stayed here six months, I could train as a nurse, do you agree? If you do

[1] Alas, a vain hope.

where do you suggest I train? I should like to have a training behind me, it gets you somewhere. Must stop now and go to Church.

Your obedient (?) servant!

ANNE WILKINS[1]

PS. I don't know all the letters after your name so I hope this reaches you.

Nine days later:

DEAR MAURICE,

You see my above address?! Another job gone! 2 p.m. precisely I was told! I'm jolly pleased. I hope you are well? I've not heard from you but perhaps you are a slow answerer of letters! Not prompt like me! Perhaps a civil servant's life is very hard, overdrugged by too many cups of tea I should think! I'm thankful I can drink something more potent again! Maisie I think is well, Harriet has had a very slight illness but I think now is fully recovered. Dorothy has her sister-in-law and small son staying and her mother arrives to-morrow, rather a squash in that delightful little dwelling I should imagine. Mother is much better from her fall and has instructed me to inform you of 'the sad loss of yet another job!' I wish I had charm which I could turn on to people I disliked as I fear I dislike the majority of people I come across! A pity! I can't court the people who 'alienate'[2] me and whom I 'alienate.' It's easy to say turn off the alienation but dashed difficult to do it in fact, don't you think? A sermon for you! But I'm sure you're so full of charm that you don't alienate anybody! Mother sends you her love which proves that she adores you! I'm not forward enough to do that so don't worry about me! Phyllis's dachshund is very sick which is disturbing to our lives! She's eaten something which has disagreed with her stomach, according to the veterinary surgeon. Well, we'll be seeing you.

Yours very sincerely,

ANNE

Nineteen days later, as the attack was beginning to subside:

DEAR MAURICE,

A thousand thanks for your letter. I do admire your handwriting. I'm not nearly so tired living at home, and have got over

[1] All proper names, as elsewhere in the book, are fictitious.
[2] A reference to a former conversation.

being upset at having been given notice, thank you very much, as I think the good lady was quite justified, she didn't understand me! I'm going to continue Art with a capital A! I love it! Mother and I both agree that I should benefit by a change from home, we were thinking of asking a very kind girl friend to have me in Devonshire for a couple of weeks, what do you think of the idea? I will give your love, as you ask, to Maisie and Harriet and Joan. Margaret is a charming baby now, very healthy looking and adored her grandmother and giggled delightfully; I liked the grandmother too. Yes, Mother has quite recovered from her fall, thanks awfully, and is full of life. I sympathise with you having to deal with Americans, I have a strong prejudice against them. Beryl, my sister from abroad, has started a job to-day with the Smith's near London. I sympathise with her as I hate jobs! Such a strain. I hope you are not overworked, I thought we were going to see you shortly. Perhaps it was my mistake.

Yours very sincerely,
ANNE WILKINS

But, *even after conversation with the patient*, the letters were crucial for diagnosing the state, however strange that may sound. This raises the question: If post-operative hypomanic states are so elusive of observation, how many may have escaped notice, and therefore how many relapses may have been unobserved? It is possible that the extraordinary behaviour of CASE 81, recorded on page 50, may have been hypomanic in origin, though the description given by the family did not suggest it, and though he showed no outward abnormality at interview.[1] And if post-operatively hypomanic states are difficult to diagnose, how much more so may not be depressions? CASE 40, who gave an excellent and classical account of a depression after operation before her 'bloody bitch' hypomanic phase, showed nothing amiss to her family: and the wife of CASE 19 (page 130), (thought by the writer to have persistent post-operative symptoms of depression), did not realize that he was depressed at all, any more than did the relatives of CASE 57 (page 141), who were astounded at her answers to simple questions.

[1] [illegible] CASE 72 (page
136 [illegible]
ove[illegible]
tho[illegible]
from within himself, that the circumstances had not caused it though he had used them as an excuse It stopped suddenly and for no apparent reason.

These questions may seem only of academic importance, yet they may be crucial for understanding not only the post-leucotomy state but the aetiology of manic-depressive psychosis.

In conclusion, we may remind ourselves that in this group of recurrent affective disorders, as a whole, the women did slightly better than the men, the age of the patient did not in itself affect the outcome, the frequency of recurrence was of no ill omen so long as there were remissions of good quality between recurrences. The length of attack did, however, seem significant in that those who had been ill continuously for longer than 3 years did on the whole less well than those who had been ill for shorter periods of time; the earlier the age of onset the greater—it seemed—were the chances of post-operative relapse, and the presence of manic features was an unfavourable factor, while the difficulty in recognizing post-operative hypomanic or depressive states as such (owing to their modified form) may account for the puzzling nature of some of the post-operative behaviour.

Finally, the figures suggest that a favourable response to electroplexy is a favourable omen for treatment by operation, but that the converse is not the case.

Cases with single depressive illnesses

There remain 38 cases who had single depressive illnesses, in that they were operated on in course of the only attack which they had experienced.

(1) *Involutional melancholic cases*

Twenty-one of these cases may be considered under the diagnostic heading 'involutional melancholia.'

Whether or not it may be thought that such a diagnostic entity is a fiction, it is none the less a convenient one, and especially so for the 21 cases that we are about to consider. For this purpose, involutional melancholia is regarded, therefore, as an entity in itself with affinities both to manic-depressive psychosis and to schizophrenia, occurring in the later life of persons not previously subject to affective disturbance: characterized by depression with agitation and hypochondriacal features, and with a special tendency to be precipitated by bereavements, financial anxiety, and

the threat of poor health, in patients of rigid personality with inadequate social adjustments.

Hoch and MacCurdy, in their classical paper (1922), conceived of involutional melancholia as occurring in two forms: (1) with a marked emotional reaction, usually anxiety and restlessness, with prominent delusions of death and poverty, to which peevishness and hypochondria may be added though not sufficiently well developed to be consistently dominant features in the psychosis, and (2) with, instead of frank fear reactions, much moaning, whining, surliness, seclusiveness, together with restriction of interest in about half the cases, while though death and poverty ideas are present in much the same proportion as in the first type, hypochondria is in this second type more prominent. They regarded the first type as being more related to manic-depressive psychosis, and the second as being more related to schizophrenia, with a prognosis correspondingly worse in the latter than in the former.

It is impossible to consider these two types to be clear cut, for in some cases the pattern of illness may gradually change from one form until it more nearly resembles the other, while some cases have features of each type in combination.

However, there were 12 cases which can best be considered as belonging to Hoch and MacCurdy's Type I (that more allied to manic-depressive psychosis). Of these, 4 patients failed to recover.

CASE 8, aged 70, a rigid, solitary, and somewhat narrow person, had become plunged into melancholy following a bereavement at 56. Over a period of 14 years the condition had shown a tendency to shift more from the pattern of Type I towards that of Type II, so that, though she had started with frank fear reactions, she had over the years become almost inaccessible, was surly and seclusive, but would occasionally announce that she was dead or poisoned, and more rarely might shout. She was doubly incontinent on occasion. After operation, her appetite, sleep, and nutrition were all improved, and she was considerably more accessible, revealing various misidentifications specially as regards nephews and nieces whom, oblivious of time, she believed still to be children. She continued to say that she was dead and poisoned, but now she said it with a gracious smile instead of in a sullen mutter. She could actually hold a conversation. She still shouted on occasion, and was

doubly incontinent rather more often than before. She was a less melancholy figure, even though substantially unimproved.

CASE 9, a man of 59, had shown the insidious development of an agitated depression, in a setting of enforced retirement owing to serious threats to his health, over a period of 2 years between the ages of 49 and 51. An over-scrupulous and meticulous man, with few interests, aggressive, but with marked inferiority feelings, he was the last person to adapt himself with calm or confidence to such a situation. The illness gathered momentum, and after 2 years of ingravescence, reached its fullest form. The patient spent the following 8 years in a state of intolerable restlessness, picking and rubbing, pacing up and down, tearing up paper, screwing up handkerchieves, pushing things into his nose and ears, weeping, fearful, and enveloped by ideas of ruin. He cried aloud, wringing his hands, that he was 'a rotting mass of secondary syphilis,' had ruined himself by masturbation, that he was dying, ought to be dead, and brought only misery to all that he knew. He said that he was an imbecile, was getting sillier and sillier, and also that he was getting smaller and smaller. He spent his waking hours trembling and moaning his fate, while at night he slept poorly, tormented by wretched thoughts. He could sometimes be brought, in the evening when he tended to be a little calmer, to manage some darning which he did with meticulous care. It was his only constructive activity. After operation he lost all his agitation; he sat still, no longer tremulous or frightened, and looked the picture of tranquillity. His conversation was flippant, punctuated by satirical laughter which, for such a person, came surprisingly near to giggling, and contained much smart repartee. He seemed to show the height of good humour, and he made no spontaneous complaints. Once he started to talk, however, a different picture was revealed. He was quick to point out that his laughter was automatic, beyond his control, and provoked by silly things; such fatuousness, he added, was proof of that imbecility on which he had long insisted, and as good an indication as anyone could wish that he was, as he had said, getting sillier and sillier; when pressed as to whether he was getting smaller and smaller, he took refuge in some masterly philosophical equivocation. That he was dying, however, he had no doubt, and he was convinced of being ravaged by syphilis, and irreparably ruined by masturbation. As to whether or not he were depressed, he refused to commit himself since he said that he had no feeling at all, and insisted on it, claiming that such a state of affairs showed that he was not human, but, as he had long claimed, was sub-human.

Obstinate self-depreciation of this sort had always been part of his armour in pre-psychotic days. 'I don't feel,' he aggressively maintained, '*I don't feel anything at all, I'm not human. I see jam and* I know it's jam, but it doesn't make my mouth water. I don't feel anything at all.' That, though he looked it, he was cheerful, he emphatically denied: 'I ought to be dead, and I wish I were.' He could [illegible]

before; accompanying the laughter, there was no inward experience *except intellectual perception* of what he laughed at. He spoke his mind, when criticized or thwarted, with an instantaneous candour quite foreign to his former habit, but he felt no accompanying emotion. He did meticulously accurate clerical work in the hospital office, to which he has become indispensable. He has been seen repeatedly, and it has been observable that the automatic nature of his giggles has been much changed, so that his laughter has become more controlled, if less in evidence, and more appropriate. His interest in his relatives, in hospital events, in current news, has much increased, despite his denials. Indeed, he minds now very much over such matters as whether or not he has a cigarette. He seeks entertainments, and several times, by a surreptitious approach, he has been got to admit that he has somehow actually enjoyed something of some sort. His beliefs in the causes of his illness are held with less conviction and are given a humorous twist. He complains still of loss of feeling: 'It's queerer than anything in Edgar Allan Poe. Here I am, I'm not human, I'm useless, it's a tragedy, yet I laugh at it and see it has a funny side, but I haven't any feeling and I ought to be dead.' Here, as in CASE 57, page 141, CASE 19, page 130, and CASE 38, page 143, it seems that the central core of the illness has persisted, but that, through a reduction in the elaboration of his emotions and his thoughts, and therefore in his agitation, his attitude towards the illness has been altered Now, 3 years after the operation, he is unrecognizable as the agitated depressive patient that once he was. Though not recovered, he could long since have been discharged had it not been for housing difficulties.

CASE 85, a woman of 56, with residual hemiparesis from a cerebral thrombosis at 54, said, 'I've been battling with my nerves, haven't enjoyed a bit of food for 3 years because I can't digest it. My mouth and throat are so dry and my stomach feels packed with stinging nettles. I don't know what to do with myself, and I used to be so happy. *I don't know where to go, I'm like a dog with a*

squib inside him; they shoot a mad dog, though. I have dreadful difficulty controlling myself, day and night. I'm so frustrated because I don't find myself getting any better, and I'm so terrified because I don't want to linger on like this for years and years. Could you feel happy when you can't eat your food and when you can't lie down in bed and shut your eyes? I'm like this from 6 in the morning till 12 at night, looking at any object to keep me from feeling like this. I used to cry, I can't cry now, my tear ducts have dried up. Why can't I? All I can do is to say, "Oh, oh." When I sit down and try to do a bit of knitting I find the yellows mixed up with the greens and I jump up and then I am mad.' (She did jump up wildly, wringing her hands, while her hemiparesis caused the affected foot to stamp on the parquet floor like a revolver shot.) 'I feel ashamed in front of anyone. I daren't let my mind wander on to my daughter or my husband or the outside world because my stomach gives such a leap. I would have liked to pass away, I haven't the urge to live. Oh, my head is swimming. I feel myself tightening and tightening and tightening. The whole thing really started off with not being able to keep still. . . .' She had been literally to dozens of doctors owing to 'indigestion,' queer epigastric sensations, vomiting, etc., and she poured forth a torrent of symptoms, involving 'the bile' and 'the gall' in a confused medley of hypochondriacal complaints, which had been the first presenting features of involutional melancholia.

Post-operatively she was still inclined to talk about 'the acid' and 'the gall' if encouraged, but she could eat any article of diet and did so, and denied that she had ever had indigestion. The whole syndrome, she said, had been caused by drugs, and she couldn't see why she had been subjected to an operation. She was aggressive and gay by turns, in general friendly, but garrulous and discursive, though very inactive. She was grossly outspoken, very irritable, had threatened the charwoman with a poker and knocked her glasses off, after which she was furious with her husband for intervening. Once the most house-proud of women, she now wouldn't be bothered, and left the dusting and cooking to her husband. She cared little for her own appearance, and slapped on her make-up without pretence at camouflage. Cerebral arteriosclerosis, with a blood pressure of 220/120, contributed to her personality change, and so probably did the release of hypomanic elements. She died from a second stroke before the first post-operative year had elapsed.

CASE 70, a 64, who had become increasingly hypochondriacal (in contrast to former habit) with gradually deepening depression

Obstinate self-depreciation of this sort had always been part of his armour in pre-psychotic days. 'I don't feel,' he aggressively maintained, 'I don't feel anything at all, I'm not human. I see jam and I know it's jam, but it doesn't make my mouth water. I don't feel anything at all.' That, though he looked it, he was cheerful, he emphatically denied: 'I ought to be dead, and I wish I were.' He could [illegible] before; accompanying the laughter, there was no inward experience except intellectual perception of what he laughed at. He spoke his mind, when criticized or thwarted, with an instantaneous candour quite foreign to his former habit, but he felt no accompanying emotion. He did meticulously accurate clerical work in the hospital office, to which he has become indispensable. He has been seen repeatedly, and it has been observable that the automatic nature of his giggles has been much changed, so that his laughter has become more controlled, if less in evidence, and more appropriate. His interest in his relatives, in hospital events, in current news, has much increased, despite his denials. Indeed, he minds now very much over such matters as whether or not he has a cigarette. He seeks entertainments, and several times, by a surreptitious approach, he has been got to admit that he has somehow actually enjoyed something of some sort. His beliefs in the causes of his illness are held with less conviction and are given a humorous twist. He complains still of loss of feeling: 'It's queerer than anything in Edgar Allan Poe. Here I am, I'm not human, I'm useless, it's a tragedy, yet I laugh at it and see it has a funny side, but I haven't any feeling and I ought to be dead.' Here, as in CASE 57, page 141, CASE 19, page 130, and CASE 38, page 143, it seems that the central core of the illness has persisted, but that, through a reduction in the elaboration of his emotions and his thoughts, and therefore in his agitation, his attitude towards the illness has been altered. Now, 3 years after the operation, he is unrecognizable as the agitated depressive patient that once he was. Though not recovered, he could long since have been discharged had it not been for housing difficulties.

CASE 85, a woman of 56, with residual hemiparesis from a cerebral thrombosis at 54, said, 'I've been battling with my nerves, haven't enjoyed a bit of food for 3 years because I can't digest it. My mouth and throat are so dry and my stomach feels packed with stinging nettles. I don't know what to do with myself, and I used to be so happy. I don't know where to go, I'm like a dog with a

The material was somewhat different.

CASE 64, a woman of 56, on descending from a step-ladder one afternoon, became suddenly mute, looked 'queer,' and was put to bed by anxious relatives, after which she talked some incoherent nonsense. She lay in the bed wagging her head from side to side, and then started to sing nursery rhymes. She sang all night, but in course of it she said that she felt 'terrible, so sad,' and that she would have to go to the local mental hospital. On the following morning she got up as usual, made tea, said she'd felt queer the day before but was now all right again, and behaved normally till nightfall, when she repeated her performance of the previous night. Later she became very agitated and distressed and was removed to hospital, where she became withdrawn, almost inaccessible, and refused food which, however, she would take if given her by her husband; whether or not she thought that food given her by others was poisoned was not established. The illness ran a fluctuating course, with phases of accessibility, during which a depressive content was expressed without noteworthy discrepant features. She became well enough to go home, but when there she worried persistently and kept on saying she'd have to return to the hospital, which she did. She was thereafter for long periods in a semi-stuporose state, from which she could be roused, but would make little conversation. No distortions of content could be elicited, but she said that she wanted to do nothing except lie in bed for everything was a burden. Later, she said that she had felt quite miserable, had been (as appeared to be the case) aware of what went on, but had felt so entirely enfeebled that she could hardly bring herself to move. Operation was undertaken when the illness had lasted for a year.

CASE 36, a widow of 63, became increasingly depressed and apathetic after the death of her husband until, 5 months later, she was immobile unless pushed, and would talk only to herself in an occasional low, unintelligible mumble. When admitted to hospital she was continually restless, required constant watching lest she rolled out of bed, and presented a general appearance of utter dejection. She slept little and tended to refuse food. After electroplexy she became more accessible and would answer simple questions in a slow, sad tone. Her condition, though it responded on the whole to this treatment, fluctuated a good deal. At times she was so restless that she required seclusion in a padded room; at other times she needed to be tube-fed. Between relapses she was able to get up and walk about, and would present an appearance of full normality apart from a certain vagueness. Then she would become

and variable agitation over a period of 10 years (in a setting which involved 2 bereavements, 1 of which was by suicide, the relegation of her husband to chronic invalidism, and serious threats both to her health and financial security), had become completely preoccupied with her symptoms until she had worn out her relatives. She was intolerant of heat, of cold, of noise, of silence, of solitude, of company. The hypochondriasis overshadowed the depression, but the latter was quite severe. Two operations had been mistakenly performed. Electroplexy had conferred no benefit. Post-operatively she was transformed in that she was no longer concerned over health nor an invalid, but was active and able to take interest. Though her relatives were fully satisfied because her importunity had ceased, she was, in fact, still depressed at even a year after operation, said she was not herself, but 'had the brake on,' was prevailingly sad, dwelt on the gloomier topics, and could be easily moved to tears. She was the same, to a slightly less extent, at 2 years after operation. Thus, she was not fully recovered, but she read extensively, attended to all her duties, was sociable, travelled, kept in touch with current affairs, and on superficial acquaintance was no less well than any other healthy woman of her age.

The other 8 cases with involutional melancholia, Type I, all recovered, were discharged home, and have remained there. One of them was temporarily removed to an observation ward, however, on account of the quite unnecessary alarm felt by a tactless and provocative relative who quarrelled with him while he was staying with her pending the purchase of a house of his own; another, a most successful case with minimal personality changes, died more than a year after operation of bronchial pneumonia with heart failure. All resumed their former lives post-operatively, and except for the case quoted (CASE 85), who was deteriorating through cerebral arterio-sclerosis with hyperpiesis, none showed undesirable personality changes of note.

Of the 9 involutional melancholics of Hoch and MacCurdy's Type II (allied to schizophrenia rather than to manic-depressive psychosis), 1, very ill with a B. Coli septicaemia complicated by the psychosis which made him impossible to nurse, died some days later of the septicaemia rather than from the operation; another, with auricular fibrillation, also died some days later from heart failure rather than from leucotomy. This leaves only 7 cases for study.

prognosis); 2 were enormously improved though severely ill for 10 years; the fourth was relieved of depression but was not recovered in other ways, owing partly to cerebral arteriosclerosis with hyperpiesis, and partly to release of what were probably hypomanic elements. The other 8 cases recovered, though 1 had been ill for 12 years and another for 8 years, while the rest had had illnesses lasting between 6 months and 3 years.

Of the 9 cases belonging more to Type II, 2 died soon after operation. Of the 7 survivors, 2 have not fully recovered, though able to live at home; 1 shows extreme inertia with lack of interest and organic deficits following a second operation in a posterior plane; the other shows still remnants of hypochondriacal querulousness. The remaining 5 have fully recovered from their illnesses, which had lasted for between 10 months and 5 years. In all, 17 out of the 21 cases were able to live at home.

In both groups there was a tendency for those with the more prolonged and unremitting illnesses to show less in the way of recovery than those with the briefer and more variable illnesses. Thus, in the Type I cases, the 4 unrecovered cases had been ill for 14, 10, 10, and 3 years. Of the 8 recoveries, 5 had been ill for less than 3 years; of the 3 recoveries who had been ill for 3 years or more, the symptoms of 2 were markedly milder than the rest, and had shown much fluctuation, while the remaining case, who had been ill for 12 years, had repeatedly been restored to near normality by electroplexy, which had had to be discontinued owing to frequent fractures and/or dislocations, as well as owing to repeated relapse. Likewise, in the Type II cases, the 2 patients who did not recover had been ill for more than 5 years, while the 5 who did recover had all been ill for less than 5 years except 1, who had shown frequent spontaneous fluctuations, during one of which she was operated on when somewhere near recovery. The figures are such as to suggest that unless there have been marked fluctuations, either spontaneous or induced by treatment, there is less likelihood of recovery if operation is postponed for more than about 2 years, but that as long as such fluctuations are obtainable, by whatever means, the chances of recovery through operative treatment remain quite high over long periods of time.

As regards response to electroplexy, of the 12 patients belonging

depressed, restless, and agitated, and would slide back into a state of troubled semi-stupor. After 30 applications of electrical treatment, she was well enough to go on a short visit to a relative, but she relapsed entirely within a fortnight, at the end of which she was again miserable: 'I get so depressed, so depressed.' There was a hint, in her fragmentary remarks, of delusions of poverty. She became also doubly incontinent. She lay in bed all day, never speaking unless spoken to, but plucking at the bedclothes and restlessly rolling about. In conversation her rapport fluctuated very much, so that at times she would answer in a quick, firm tone, at other times in a low, whispering mutter, and often not at all. The more that any topic tended to have painful affective association the more nearly stuporose the patient became. She was operated on after the illness had lasted for 10 months.

The other cases were not subject to stupors, but showed frank depression of mood and activity in varying degrees with suicidal thoughts, and a surly querulousness the importunate expressions of which were the only relief from a despondent taciturnity.

Of the 7 cases who survived the operation, all were able to go home. But 1 was not fully well, relapsed further into depression, and later returned for a second operation; this was done in an intentionally posterior plane; she has become an extremely inert person, dysphasic and liable to confusion, lacking in interest and energy, with just enough interest to be depressed by her state; over a 2-year period since the second operation she has improved somewhat, is no longer an anxiety through thoughts of and attempts at suicide, but presents a sad picture of dulled, disinterested, but distressed inertia with irreversible organic damage. Another improved very slowly, with gradual fading of a hypochondriacal querulousness with muttering and seclusive hostility, in favour of an increasingly wide and cheerful interest in outside affairs including music and nature study; after nearly 2 years he was fit for discharge home. The other 5 patients were all well and at home within 6 months of operation, and have remained so since.

Thus, of the involutional melancholic patients, 12 belonged more to Hoch and MacCurdy's Type I, and 9 belonged more to Type II. Of those belonging to Type I, 4 failed to recover. One of those 4 had been ill for 14 years, during which the illness had come increasingly to conform to the Type II pattern (with worse

increasing pessimism with increase of worry from the age of 18 onwards. This continued until she was 26, when she sought hospital advice on which she became increasingly dependent. The development of these symptoms was in some measure related to the waywardness of a post-encephalitic brother (at one time certified owing to a murderous assault on his father) of whom she lived in fear, especially as he held her largely responsible for his certification which he had keenly resented. The symptoms did not, however, wax or wane with the brother's detention in hospital, or with his return home from it, and they continued long after he had settled down into a benign and tolerable state. The patient was improved neither by hospital attendance nor by a period in a 'rehabilitation centre,' and found herself unable to concentrate at her work, owing to preoccupation with suicidal ideas and with her own feelings which had come to include de-personalization with flattening of the affect, so that she complained of things being devoid of affective significance. She complained also of being unable to visualize things; but prolonged consideration of this showed that it was not so much a failure of visual recall as an inability to evoke any appropriate affect when indulging in the process of recollection. She was admitted to hospital at 27, and was treated with electroplexy, modified insulin, continuous narcosis, various abreactions, and medication with vitamins and benzedrine, as well as psychotherapy. She was substantially unimproved though discharged from hospital, and was readmitted some months later, more agitated and complaining incessantly of unreality feelings with loss of affect, and their significance as regards her future sanity. Further repetition of physical treatments and psycho-therapy was without effect.

CASE 21, a man of 41, always moody, liable to brood, over-scrupulous and over-conscientious, but without history of previous breakdown, suddenly became worried that by having undertaken voluntary war-work in a factory on Sundays he had infringed a code of ethics, to which as an optician he was a signatory, which pledged him not to do work outside his profession. He further complained of the way the factory was run and that his work there was not appreciated nor explicitly enough directed. This was unfortunate, as this work at the factory represented an attempt at solving a conflict as to where, in war time, his duties lay; this was further expressed in a notion that the neighbours disapproved of him because he was not doing fire-watching as well. He became acutely anxious and uneasy, sweaty and tremulous. His anxiety was increased by some small misfortunes at work, as when a customer

to Type I, there were 4 who never had electroplexy owing to physical hazards of one sort and another; of the 8 who had it, 1 was rendered worse but recovered after operation; 3 received no benefit, but 2 recovered after operation; 4 received transient benefit, and all recovered after operation. Of the 7 survivors of Type II, there were 5 who had had treatment by electroplexy; 2 of them benefited, and both those recovered after operation; 3 did not benefit, and only 1 of those fully recovered after operation. The figures, though small, suggest that even transient response to electroplexy is a favourable omen for operative treatment, though failure so to respond is not a contra-indication.

(2) *Other single depressive illnesses*

We are now left with 17 patients (the last in the group with affective disorders), who had had single depressions which did not, however, belong to the involutional category, in so far as they did not sufficiently fit in with our definition, although in 4 of them the illness occurred in what might have been considered the involutional period of life.

They form a very varied group. Eleven of the 17 may be considered together in that in all of them it is believed that, though there were reactive elements, the illnesses could not on common-sense grounds be attributed merely to reaction to outside events; the symptoms were too massive, too unremitting, too prolonged, too disproportionate to the situations and to the previous pattern of behaviour to be thus construed, without invoking the co-existence of other factors. Eight of the 11 patients were immediate suicidal risks. One had lost an arm through jumping intentionally under a train; 1 had attempted to jump out of a window; another had cut his throat, and made repeated subsequent attempts. In all 11 cases the illnesses had completely disrupted their own lives and dislocated those of their families. That was, however, almost their only point in common, and the variety of the material may be illustrated by some sample histories.

CASE 71, a girl of 28, always over-conscientious and a worrier over health and work, subject to morbid fears of disease, too readily elated or dejected, too easily made anxious, given to brooding when displeased, and always solitary but dependent, began to show an

compelled to dwell on imaginary pictures which she conjured up, at first of the conditions in which her mother had died, later of any unpleasant sight that she had seen or event of which she had read, to the exclusion of what she called 'natural thinking.' Her mind would say, she said, 'Keep on thinking of that like you think about your mother,' and so she would. She was 'very unhappy,' with 'a certain amount of shame, for my mother wouldn't have had me grieve like this, after all I've got the children to look after....' She feared constantly that these recurring thoughts heralded insanity; but she had little else in the way of affect, 'I try to do things, but I can't enter into things, I go to the dances here and I do talk, but I might as
through my h
the most cold-
it's as though my body and voice travel on without any feelings; my mind is just concentrating on my mind, I'm like an automatic machine, it's as though I lack a soul. I'm fighting to be the person I was once, interested in shops and so on, in every part of life, but it's just a race to get away from myself all the time.' The effect of the 'race' was to make her extremely tense; 'I'm so strung up with this desperate feeling of how to get through the day....' She had repeatedly contemplated suicide, and had felt it wise to have someone in the house lest, when alone with the children, 'something might snap' and she might become wildly insane. Although there was dramatization in the symptoms, there was much that was genuine. Prolonged psycho-therapy, aimed at the guilt which the symptomatology suggested, had been useless; electroplexy had wrought repeated temporary improvement, with return of appetite and sleep and restored menstrual function, but only transiently.

Case 7, a man of 53, with diffuse gloom which led to continual expectation of disaster, and with a depressive delusion that he had behaved improperly in forming too close a liaison with a lady friend of his wife's, became too afraid to travel in a train, or to cross a country road without assistance; he had been a distinguished military officer, a skilled horseman, and had represented his country in athletic pursuits.

Case 27, a woman of 61, always erratic and unstable, with many hysterical features, had taken to bed in a state of alarm over her health, beneath which lay a genuine but fluctuating depressive mood; she had remained in bed, from which she tyrannized over the household, virtually for between 7 and 8 years.

This was the sort of material in this group of 12 patients with

(through a genuine mistake) presented a cheque which was later dishonoured, immediately after which another presented a form which was filthy for the patient's signature. He considered both these to be hostile acts: the former intended as a punishment, and the latter an insult to his own meticulousness. He became increasingly uneasy, brooding, and depressed, with fears of insanity. He was prevented from making a suicidal attempt one night, but 4 weeks after the onset of symptoms cut his throat with a razor. On admission to hospital that day he believed that his family was involved in some impending disgrace, and that there was to be a court case over some trivial matter concerning a pair of shoes. He was depressed, agitated, and remained so, banging his head against the walls or floor, breaking glass in an effort to cut his arteries, trying to suffocate himself with porridge and bread, and continually restless by day and by night. Electroplexy controlled this state to some extent, but the effect lasted no more than a few days or a week; after 70 applications he was in a state somewhat reminiscent of punch-drunkenness, in which, though seemingly cheerful, attempts at self-harm would be impulsively continued. The prevailing depression continued, however, until he was operated on nearly 4 years after the onset of illness.

Case 47, a 39-year-old woman, complained that she had been 'depressed' for 2 years, associated with 'over-awareness, my brain is so active, I seem to notice everything, my brain can never rest, I over-notice things . . .,' and with a peculiar disinclination to do things of any sort. She was fearful of impending insanity with inability to recover, and ruminated much on suicide, for which purpose she had bought some disinfectant, but had felt too shaky to pour it out. She showed bursts of tearfulness. The condition was accompanied by anorexia, loss of weight, difficulty in getting off to sleep with early waking, and amenorrhoea. She had one peculiar symptom, the significance of which was never understood; she felt *that she had a gap in her back, between the shoulder-blades*, of which—especially when she went out—she was constantly aware. She did not believe this gap to be there in fact, and knew that it would not be there if she felt it or looked in a mirror, but she was much irked by the sensation. She was exceedingly anxious to recover. She had been in two mental hospitals as a voluntary patient, and much discouraged by failure to improve, had discharged herself from both, after many months and despite 30 applications of electroplexy, with her state unaltered.

Case 84 (see page 176), a woman of 37, had for 6 years been

suicide though he made no more attempts, and passed through an aggressive phase which, after 4 weeks, gave place to a fatuous state in which he was elated, easily amused, and childish. He then became steadier and worked well. Six months after operation he was considered by the nursing staff to be perfectly normal. But at interview he complained only (though very earnestly and at length) of a difficulty in reading small print; he had no insight whatever into his illness, was quite unconcerned at having spent 4½ years in a mental hospital, could see no reason for his having done so, but was disinterested in the matter, and had no plans for either the immediate or remote future. He was unduly cheerful, was friendly and over-familiar, laughed too easily, and was fatuous. His conversation was garrulous and very circumstantial, though only in response to stimuli, in absence of which he did not talk spontaneously at all. He was discharged home in the seventh post-operative month. When seen there 12 months after operation he was reasonably spontaneous, showed no fatuousness, was polite and restrained. He showed adequate activity both physical and intellectual, read books, had some grasp of current affairs, and went not uncritically to the cinema. He was dissatisfied with his situation at work, as the rearrangements necessitated there by his long absence prevented him from being restored to his former position. He lacked interest and initiative, but was superficially normal. Yet those who knew him better did not find him so. Formerly attentive and affectionate to his wife, he was now indifferent to her welfare: his interest in his home had gone, and that seemed due to lack of feeling rather than to indolence: he had lost his meticulousness, though he objected to the lack of it in others: he left his work unfinished, was unemployable on that account but quite unconcerned about it: when taken to task he was either blandly incredulous or irritable: the familiar lack of restraint was there, mainly in evidence in the home: he readily expressed annoyance and shouted at the children: he never expressed joy or pleasure. He had occasional brief phases of being more animated, for a few hours or a day at a time, when he would try to force others to be the same, but he would soon sink back into indifference. Some 18 months after operation his firm was obliged to dismiss him owing to his inefficiency at making spectacle frames, after which he became further languid and apathetic, and now ceased to control the urgency of micturition which he had had since operation, so that he did not care if he wet himself in the street. In the hope of rehabilitating him, he was readmitted to hospital. When seen there 2 years after operation, he had controlled his incontinence,

single but varied depressive illnesses, in which it was believed that there were essentially constitutional and non-reactive elements, though there was much that was reactive as well.

One patient, a hyperpietic man, died of cerebral haemorrhage. Three others were not fully recovered.

CASE 71, page 170, was improved to the extent that she no longer complained of depression, was able to laugh and smile, was more interested in so far as she went out for walks and to the cinema, was able to work at a light domestic job, and was in general less anxious. Physically, she had become 14 lb. heavier than her normal weight, having been 42 lb. below it, she ate heartily, whereas her pre-operative appetite had been negligible, she slept well instead of badly, and regular menstruation had replaced amenorrhoea. But she was still afraid for her health and sanity, still complained of unreality feelings and of affective loss. Twelve months after operation she was less well in that, having lost her job through no fault of her own and having refused to trouble much about another as an aggressive protest against some off-hand behaviour on the part of the labour exchange, she used her free time to think about herself, and again became preoccupied with her symptoms. These now showed some diurnal variation, not previously observable, in that she became more cheerful and extraverted as the day wore on. She was in general, however, lackadaisical and disinterested, complaining that she felt always tired and that she lacked emotion, and that, though she worried less, she could not help worrying about her future health. 'I'm not like I was, it wouldn't worry me if the ceiling fell on me now, I don't worry, only about that I won't get better.' She was distinctly irritable if anything happened to upset her, and had somewhat aggressively arranged for her readmission to hospital, as she was dissatisfied with her degree of improvement. She left hospital symptomatically unimproved, but was persuaded to take up some domestic work again at which, while under out-patient supervision, she has continued since. But she still had unreality feelings with affective loss, and was concerned about herself, preoccupied with her ills, and prone to self-pity. Much of this state was what she had shown for many years before operation, some of it was due to post-operative personality change in the form of lowered drive, some of it was a residuum of the depressive illness.[1]

CASE 21, page 171, post-operatively inquired about means of

[1] A second operation, more than 2 years after the first, led to a certain fatuous euphoria with less pre-occupation with the symptoms, though those were little changed. The patient was also more outspoken and irresponsible and less active than before.

weeks of operation, and within 6 months had driven himself to the south of France. Always a naïve and anxious man, he was so still, but post-operatively he worried only over direct threats to his personal security. Over other things he was sometimes careless even to the point of irresponsibility.

CASE 27 (page 173), who had tyrannized the household from her bed in which she had lain for upwards of 7 years, lost her histrionics, her fears, and her depression. Always superficial and trivial, she was more so. Always inclined to denigrate others at the bidding of her own sense of insecurity and inferiority, she tended post-operatively to praise them, for she felt neither inferior nor insecure. Always egocentric, partly through a morbid self-consciousness and awareness of gnawing inner needs, she was less so, for she felt less self-conscious and less sense of need. Always demanding and inconsiderate, in over-compensation for her own inadequacies, she became less thoughtless and more adaptable, for the sense of her own inadequacies was much reduced. Always indolent, she was more so and, indeed, somewhat resembled a figure at the waxworks. But on the whole the gains were great.

Of the other cases, all were excellent results save 1, who, always intolerably aggressive by nature and not through neurotic over-compensation, was more so: always selfish and patronizing through what appeared an innate sense of superiority and self-importance, always without self-criticism, she was more so: she was indolent, outspoken, rude, hectoring, and intellectually impaired. Even so, there was gain, for the household had no longer to tolerate her incessant hypochondriacal complaints, her self-pity, or the restrictions which she imposed upon them by her invalidism.

Thus, of 11 cases with single depressive illnesses, 1 (who was hyperpietic) died at operation, 1 was partially relieved but not recovered, 1 lost his overt manifestations of depression but was left with a fundamental apathy. Yet both these last were substantially improved over what they had been. Eight recovered, and, despite some deficits, 7 of them were excellent results when the quality of the pre-morbid personalities is taken into account; the eighth, always a difficult person, became more so, but had been relieved of symptoms.

seldom showed irritability, and was placidly indifferent over his failure at work. He was quite unconcerned over past, present, and future, in no way
constructive actior
the ordinary post-‹
of content, nor overt sustained disturbance of mood, there was a fundamental apathy far in excess of anything seen in the average recovered person. This, coupled with the affective loss, seemed to indicate a residuum of illness, for there was marked depression of function (nor had libido been restored), although he did not complain of actual depression of mood. The illness, moreover, had had *some discrepant features in its wildness and intensity, its* continued and impulsive attempts at self-harm co-existing with a mood which, after much electroplexy, was even cheerful, and though the delusional content had not been unharmonious with the mood, it had had an unreal and fantastic quality. It was concluded, all in all, that there was in this case a post-operative residuum of illness in modified form, which depressed the mainsprings of activity and affect, and in which schizophrenic elements also probably contributed to the indifference, which was not believed to be the mere result of operation.

The other 8 of these 11 cases all recovered, returned home, resumed their former lives, and have so continued since, though all had deficits.

CASE 47 (page 172) returned to work within 6 months, and though for 2 years she was flat, lacking in initiative and grossly dull, she later came to present an appearance of complete normality. Three years after operation she was still satisfactorily employed, though with marked sensorial deficits.

CASE 84 (page 172), though less energetic and more outspoken, slower, with less power of sustained application, had regained interest and feeling, was cheerful, extraverted, and no longer obliged to indulge in obsessive-compulsive rumination to the exclusion of 'natural thinking.' Though she still complained of 'tightness in the head' when worked up or obliged to attend to things for long, she was a competent housewife and mother.

CASE 7 (page 173), a man of 53, whose diffuse gloom caused him to view everything with apprehension so that he could not travel by train nor cross a country road without assistance, became gay and self-sufficient. He went by train within a few

CASE 71 and CASE 21, who did not fully recover, were considered to be far more rather than less constitutionally determined. In that of the former, whatever psycho-dynamic factors there may originally have been had become lost over the years, and by the time of operation and after, seemed to play no decisive part at all in influencing the symptoms. In the latter, the illness was quite at variance with anything that had gone before; it developed relatively suddenly without obvious precipitating factors; there was some conflict, but there was nothing in the situation that was new; the illness itself seemed quite disproportionate to any such cause, and continued for 4 years during which the patient was inaccessible to reason, while post-operatively it appeared to continue, though in a much modified form, and the psycho-dynamics seemed to contribute to its continuance in no way at all. CASE 47 (pages 172 and 176) had an apparently autonomous illness without important psycho-dynamic contributions. It is true that in course of it she became engaged and then broke off the engagement, but the family was satisfied that the symptoms had been unmistakably in evidence for 6 months before the pair had met; it is true also that she had an involved liaison with a married man which, in course of the illness, she broke off. But this had been in force for 2 years before the symptoms started, and the rupture between them has been tolerated perfectly well since operation. CASE 7 (pages 173 and 176) had somewhat more in the way of contributory psycho-dynamics, but none could be discerned that were adequate to explain the intensity, form, or duration of the symptoms.

Of these 4 patients whose illnesses were, therefore, thought to be mainly constitutionally determined, 2, who had been ill for 10 and over 4 years respectively, did not fully recover, though they were improved in that the symptoms agitated them less: the other 2, ill only for 2 years, recovered, but 1 of them was very flat and unanimated for more than a year after operation, after which she returned very much to her pre-morbid normal.

The other 7 patients (in whose illnesses psycho-dynamics had played an important part) showed rapid recovery. This point is perhaps of consequence in explaining the benefit reaped by CASE 27 (page 173), who recovered despite an illness which had lasted for 8 years. She had been unable to adjust to the change

Neither the sex nor age of the patients seemed of consequence as regards recovery.

The trend that we have hitherto observed, that recovery is related to duration of illness, is not so clear in these cases. Yet, without—it is hoped—appearing to juggle with the figures, some such relation can be discerned. If we group together the cases as they have so far been presented, the 10 surviving patients had been ill for 8, 6, 4, 3, 3, 2, 2, 2, 2, and 1 years respectively. Of these, all recovered except 2 cases who had been ill for 4 and 2 years each. But if we bear in mind that though CASE 71 had shown her illness in fully established form for only 2 years before operation, it had none the less been ingravescent (characterized by a prevailing pessimism with over-anxiety since a marked change at the age of 18) for 8 years before that: and that, though CASE 84 had had symptoms for 6 years before operation, these had originally been only of obsessive-compulsive kind, and the onset of actual depression (with loss of affect and interest, anergia and hopelessness) had supervened only 2 years before operation, the duration of these illnesses then becomes: 10, 8, 4, 3, 3, 2, 2, 2, 2, and 1 years respectively. If this rearrangement is acceptable to the reader, as it is to the writer, it becomes the case that of those patients ill for 3 years or less, 7 out of 7 recovered, whereas of those who had been ill for 4 years or more, 2 out of 3 did not recover.

There is a further point of interest. It has already been mentioned that in these cases there were reactive elements, though it is believed that in every one of them physical constitutional factors were indispensable to the production of the illness. In fact, the situational factors in this group played a far more obvious part both in the onset and maintenance of the illnesses, than in such other cases as we have considered hitherto. Four of the 11 cases only were considered to have truly autonomous conditions which persisted of their own force in the absence of decisive influences from the psycho-dynamics; the other 7 were considered to have illnesses which were influenced more rather than less by the psycho-dynamics, which not only helped to initiate, but also to prolong them. The more the constitutional elements, as judged by the writer, preponderated, the more stubborn and unremitting were the symptoms. The illnesses of

It would seem, therefore, that if depressive illnesses be conceived of, as Curran has suggested, in terms of 'loss' and 'load' (loss as represented by anergia, lowered animation and affect, reduction of interest, of decisiveness and grip: load as represented by worry and care, active despair, the pressure of responsibilities and outside events leading to activity, however ill-directed, rather than to apathy), the result of operation is to reduce the load, but to leave the loss untouched except in so far as, by reducing the load, it provides a *milieu* more favourable for recovery.

With regard to the results of former treatment in these 10 cases, it was the fact that in all of them operation was considered as a last resort. Six of them had had intensive psycho-therapy without effect. Such measures as modified insulin, abreactions, and continuous narcosis, which had been liberally used, had been quite inefficacious. All had had electroplexy, and 7 of them had reacted with transient benefit. The 3 who were not improved by it were among the essentially constitutionally determined cases, of whom 2 were only partially relieved, while the third recovered very slowly; in 1 of those electroplexy had somewhat curbed the impulsiveness of the patient, though it seemed to the writer that this had been achieved by making the patient silly and confused. The figures suggest that favourable response to electroplexy is a favourable omen for operation, but that failure to respond is no contra-indication.

It remains to consider the last 6 cases with single depressive illnesses. It was believed that all these were situationally determined in the sense that they were not autonomous but were reactions to events or thoughts, without any underlying essentially pathological process, i.e. that their causation lay outside the physical structure. The illnesses had grown out of, and were inseparable from, the patients' personalities, and were a product of the impact of outside events upon those personalities, and of the secondary reactions which followed.

CASE 80, a woman of 34, had all her life been dissatisfied, querulous, jealous, sulky, ill-tempered, moody, touchy, thinking herself 'picked on,' but not without capacity for forming warm attachments which she would guard most jealously but which did not last. She was the daughter of her mother's psychopathic second husband, but would never admit it, insisting that she was the youngest of her

from a position of eminence to the obscurity of retirement; egocentric, demanding, but inwardly insecure, she missed in her retirement the prestige and recognition which she had needed to maintain her own self-esteem; always largely dependent for success upon her looks and her feminity, the arrival of the menopause forced on her attention what she had long sought to avoid; accompanying physical disturbances, with lowered energy, made for difficulty when, for the first time servantless, she had to cope with domestic affairs. Friendless and in an unaccustomed environment, she became depressed in a genuine way; but she reacted to the depression as well as to the whole situation by beating a hysterical retreat with flight into querulous and agitated illness. Her emotions took charge of her, and having persuaded her that she had entered a state of physical decay with chronic invalidism as its only culmination, she remained a chronic invalid; any efforts which she made to overcome this were frustrated by the fact that she was actually depressed, which lent a rational basis to her emotional attitude. So she continued: but the psycho-dynamics played a vital part in maintaining and prolonging the illness, as well as in making it worse than it need have been.

The deduction is tentatively drawn that the more the constitutional factors (in a physical sense) determined the severity and duration of the illness, the less successful in these cases was the operative result. The patients were shorn of the emotional repercussions by which they reacted to the basic illness, and which in their turn contributed to it further, but 2 of the 4 illnesses believed to be constitutionally determined persisted after operation, and a third showed only a slow recovery. Where the preponderant part appeared, on the other hand, to be played by the influence of the thoughts on the mood, there was no post-operative persistence of depression that could be discerned, and the recoveries were rapid. It may be added that this conclusion is not based on the results in these 11 cases alone; in the cases of recurrent depression with slow recovery the same rule seemed to hold; in those cases of manic-depressive psychosis, where the psycho-dynamics appeared to contribute notably to the onset and prolongation of the illness, there was not only rapid recovery but the relapses were less florid and were shorter.

she entertained real fears of doing them harm. She became a burden which had to be shared, and was shipped on to some other relatives where much the same thing happened. Her hopelessness of ever returning to her profession, her resentment over that, and her morbid fears of violence increased her depression and added a sense of guilt. She was readmitted to hospital 14 months after the end of her first admission. She was unimproved by further psycho-therapy, modified insulin, and electroplexy, nor did she benefit from continuous narcosis. She remained self-pitying, restless, subject to feelings of hopelessness and futility with fears of doing violence, all overlaid by resentment coupled with a sense of inadequacy and timidity. Post-operatively she was aggressively unco-operative, violent when provoked, and is alleged to have shown a phase in which she was hallucinated. She gradually became more amenable, the thoughts of violence disappeared, and she was no longer guilty or troubled by them. She slept well without nightmares. She lost much of her self-consciousness and timidity, and was no longer hypochondriacal. She was more independent both in thought and action, but she was irritable and quarrelsome as her lifelong touchiness was no longer counterbalanced by the same previous timidity. She was also slow, both in action and comprehension, not over-nice in her personal cleanliness and appearance, spent much time lazing about, seemed disgruntled though saying she was happier, and as a witness was off-hand and unreliable. She made unsatisfactory progress in a course of shorthand and typing, which increased her hopelessness, and when a friend with whom she had lived on discharge from hospital became ill and the patient was left on her own, she became brooding and depressed, resentful of her lack of progress, and, on complaining of this when seen as an out-patient, was sent to a convalescent home where she made little improvement and on discharge from which she made a suicidal attempt. She was readmitted to hospital, had more electroplexy and modified insulin, but despite gain in weight, showed no improvement in her attitude. She was transferred to a mental hospital, where she remained disgruntled, querulous, self-pitying, hostile, and searching for affection by turns, resenting her detention though a voluntary patient, refusing treatment, and at times making suicidal threats on the ground that 'she might as well end it all, as she was in a madhouse and would never get out.' In addition, she now claimed to be hallucinated, but her accounts were contradictory, and she was so unreliable and unconvincing a witness that it was felt that she was trading on her experience of mental nursing in the hope of securing

mother's first husband's children. She developed early a pattern of blaming her own shortcomings on the rest of the world. After some encouragement she finally entered the nursing profession, and though her adjustment was always precarious, she did well enough to become an unreliable sister in a mental hospital. A nephrectomy and some hypochondriacal concern over it was followed by the war, during which she developed an intense fear of air raids. These factors, combined with her timidity which made her professional work something of an agony, formed a load too great for her powers of adjustment to cope with. She became increasingly dissatisfied, disgruntled, and resentful; the several marriages of her sisters, and the decrease—as her state worsened—of her own matrimonial chances, increased her jealousy and sense of isolation. When aged 32, in a setting of genuine danger from enemy action, she became more worried, about herself, air raids, her responsibilities in such an event, and her patients in general; she was 'on edge,' could not concentrate or relax, became unable to sleep, and felt tired, run down, listless, with appetite for neither food nor life in general, and mildly depressed. A few months of this made her unable to cope, and it was decided that she should be admitted to another hospital, where she was allegedly improved by modified insulin and electroplexy. By now, however, she had lost her post, and her future, especially for a person of this temperament, was correspondingly the worse. She was discharged to the care of a sister of whom, and of whose family life, she was very jealous, so that she continued to be disgruntled and aggressive. She contributed nothing to the household expenses, was sensitive on the point, and chose to see references to it in unrelated casual remarks. She was ready to put the worst construction on anything that was said, making a martyr of herself, and became a burden on the household, being further resentful if any remark were made to that effect. When her brother-in-law was polite she decided he was being over-attentive to her; when her sister suggested that her husband should take the patient to the cinema, the latter decided there was some ulterior motive, such as to enable her sister to spend the evening with some paramour. She was encouraged to take some humble work that was within her capacity, but she refused to make the best of it, complained that it was menial, and was further jealous of her sister and brother-in-law's comparative prosperity. She [illegible] which [illegible] knives, [illegible] so that

all right,' he was very irritable with his wife, lost the presents that she gave him (including a large and specially-coloured wedding group), and had hysterical fugues from home. He would not settle in a job, was sulky and morose, demoralized by the failure of treatment, yet relieved that it absolved him from the need for positive action. Though the condition presented in this way might suggest a schizophrenic note, rapport was good, there were no distortions of content and no thought disorder; there has been evidence of nothing but reactive moodiness with hysterical mechanisms. Operation seemed to remove what little drive the patient had before, so that he was inert, casual, unspontaneous, and indolentt while it also reduced his restraint so that he expressed free resentmen, of his wife's combined attitudes of 'mothering' him and stimulating him to activity. As he did not respond to her ministrations, and had even resisted (apart from losing his headaches) the operative treatment, she became actually hostile towards him, to which he responded with aggressive threats. He was returned to hospital within 6 months of operation, and has there remained. Efforts to discharge him have been frustrated by the wife's refusal to accept him. He has remained apathetic, lacking in interest, irritable, resentful of the turn of events, and waiting to be cured. He shows no essential abnormality either in content or behaviour, apart from a difficulty in settling to things and a marked lack of initiative, with puzzlement as to what to do for the best. He is more even in temperament than he was, without histrionics, but his potentialities, pre-operatively small, would seem to have been reduced.

Neither of these cases has recovered; in fact, CASE 53 might be considered worse, though the added difficulties of marriage, contracted almost against his will and at a time when he was unfit for it, must be held in part responsible. Both patients, however, lost their depression after operation, and it seemed to be their personalities, with their underlying attitudes, which militated against sustained recovery.

The other 4 cases all got better, but only 3 of them have remained so. An inadequate psychopath of 31, bitterly resentful of her illegitimacy, hostile to her mother, and chronically jealous of her sister, had so many feelings to conceal that she was generally inhibited, to the impairment of her adaptation to life. A series of events led her to misfortune and unemployment, as a result of which she had a prolonged wallow in self-pity with hysterical manifestations. After long and ineffectual treatment, she was

sympathetic attention and of providing an excuse for her negative attitude towards the future. Two years and 2 months after operation, bored with mental hospital life, she made attempts to pull herself together, was discharged to a convalescent home, and for a short time thereafter held a domestic post in a nursing home. She resented the nature of the work, however, compared with nursing, had lost her friends and alienated her relatives, was isolated, discontented, and unhappy. She did not work satisfactorily, and within 2 months was dismissed, after which she returned to the mental hospital. She remains, however, a more placid person and therefore a less acute problem than she was before the operation was done.

CASE 53 was not dissimilar. He was a very passive man of 35, whose lifelong habit had been the avoidance of difficulty and the quest for security. At the instigation of his younger brother he had joined the army, because it offered then a settled career in which initiative was not necessary. He contrived to stay alongside his brother for 11 years, but even when it came to war-time he neither sought nor won promotion. When his unit was captured entire, his morale collapsed. 'We ought never to have been taken prisoner . . . it sort of made me lose faith . . . when I think of it I get despondent. . . .' In saying this he was speaking not of his pride, but of the increase in his own feelings of insecurity. He felt he could never be safe again. His period as a prisoner, and separation from his brother, induced a hopelessness which became habitual, and which continued on repatriation. It was fostered by his family who had always said (what they truly believed) that he 'was not tough enough for the army.' He believed them and apathetically became inefficient, which led to disciplinary frictions sometimes 'solved' by hysterical fugues, which led to further difficulties. His usefulness was past and he was invalided. Without a pension and expected to adjust to civilian life, he became resentful as well as apathetic. He excused his lack of constructive effort on the ground of 'nerves,' which served as a reason also for leaving various jobs in which he had encountered trivial difficulties, and as grounds for hysterical behaviour at home when he gave vent to the resentment aroused by his failure to get on terms with life. It was in this state that, as the culmination of an 8 years' 'pen-friendship,' he was carried off (within 2 months of meeting her for the first time) by a determined woman who was sure that she alone could manage him, and whom he had not the moral courage to resist. He now had added responsibilities, and had to make new adjustments to his wife, her home and circle. It was noteworthy that, though he protested they 'got along

and the prospect of her future life, as an Electra without an Orestes, drove her to histrionic transports which landed her in an observation ward and thence in a mental hospital. Having lost her job thereby, she had not, as in other cases, the stamina to start anew, and as the difficulties of the future crowded in upon her the more, so did her emotionalism and hysterical flights increase. The lack of constructive help with which she met, and the natural expectation that she should help herself, drove her to further importunate demands, so that, having been released from hospital, she went from one out-patient department to another, appealed to strangers whom she met in churches, and had *crises des nerfs* in the street. In the end it came about that she had spent nearly 7 years in mental hospitals before it was decided that, all treatment having failed, some hope lay in operation. She was home, where she was decidedly nasty, within 6 months, and has supported herself since by steady work.

Finally, another hysterical psychopath, markedly obsessional, in long conflict whether or not to have a child, made such demands on her husband's attentions that she drove him to concentrate increasingly on his business duties. She was then upset by what she took to be neglect, and increased her demands. The death of her mother (to whom she was pathologically attached, and with whom, as the youngest child by 10 years in a large family, she closely identified herself) in a mental hospital, after some years with involutional melancholia, increased her emotionalism and insecurity so that she developed morbid fears of impending insanity. So faithfully, in demanding sympathy, did she play the part of a chronic invalid that she did not leave the house for 7 years, apart from two occasions; one was when she went for 3 days to a mental hospital, and discharged herself; the other was when she was taken to hospital after a determined attempt at suicide by barbiturate poisoning. The symptoms of which she complained were, though not without genuine elements, florid and dramatic: 'panic, sheer blind panic, you may take whatever you may be afraid of and multiply it a thousand times, and you'll never get anywhere near what it's like, everything looks different and seems different, and my face changes, I know, it gets set and long and my voice changes, very melancholy, sort of dirge, from one moment being full of enthusiasm

relieved by operation, and resumed work for a year. Various considerations led her to live at home, which reactivated her old conflicts so that her mind became flooded with thoughts of violence and hostility to which she again reacted with moody depression and ill-controlled emotionalism until the situation became out of hand again, and 2 years after operation she returned to hospital. She was, however, more realistic, less hysterical, and better controlled than she had been before, while her depressive moods were less intense.

The other cases showed sustained recovery. One was a man of fairly good pre-morbid personality who had been profoundly shaken by experiences in the 1939–45 war, and had felt unable to face returning to his duties. He was equally unable to face the reason for this, and he lived in a state of prolonged conflict, with high tension but little insight, with marked anxiety and hysterical symptoms. The conflict was not resolved by invaliding from the army, and he became demoralized by the persistence of symptoms, with recrudescence of conflict over questions of pension, and by the failure of treatment. Inability to live with his symptoms and to adjust to civilian life upset him further, and he entered a chronic state of demoralization with hopelessness, still with much tension and anxiety. Prolonged treatment still was unavailing, but operation removed his load, and he returned to something near his former self, so that, no longer depressed, he has resumed his married life, and has successfully supported himself and his wife without major symptoms for a period of more than 2 years.[1]

A hysterical psychopath, with the trousseau ordered, made a sudden retreat from marriage, see-sawing in conflict over whether to take up a life for which she felt inadequately equipped and the sexual side of which alarmed her, or whether to stay more securely but uncongenially with an unsympathetic mother to whom she felt marked hostility. When her decision was made she regretted it, was romantically self-pitying, brooded over a ruined life, made demands for sympathy which were rudely rebuffed, felt frustrated, unfulfilled, and angry with her lot. Her hatred of her mother assumed proportions which frightened her,

[1] He has since made a tour of the very battlefields which had been the source and centre of his conflict He found that he viewed them with interest but with detachment.

and the prospect of her future life, as an Electra without an Orestes, drove her to histrionic transports which landed her in an observation ward and thence in a mental hospital. Having lost her job thereby, she had not, as in other cases, the stamina to start anew, and as the difficulties of the future crowded in upon her the more, so did her emotionalism and hysterical flights increase. The lack of constructive help with which she met, and the natural expectation that she should help herself, drove her to further importunate demands, so that, having been released from hospital, she went from one out-patient department to another, appealed to strangers whom she met in churches, and had *crises des nerfs* in the street. In the end it came about that she had spent nearly 7 years in mental hospitals before it was decided that, all treatment having failed, some hope lay in operation. She was home, where she was decidedly nasty, within 6 months, and has supported herself since by steady work.

Finally, another hysterical psychopath, markedly obsessional, in long conflict whether or not to have a child, made such demands on her husband's attentions that she drove him to concentrate increasingly on his business duties. She was then upset by what she took to be neglect, and increased her demands. The death of her mother (to whom she was pathologically attached, and with whom, as the youngest child by 10 years in a large family, she closely identified herself) in a mental hospital, after some years with involutional melancholia, increased her emotionalism and insecurity so that she developed morbid fears of impending insanity. So faithfully, in demanding sympathy, did she play the part of a chronic invalid that she did not leave the house for 7 years, apart from two occasions; one was when she went for 3 days to a mental hospital, and discharged herself; the other was when she was taken to hospital after a determined attempt at suicide by barbiturate poisoning. The symptoms of which she complained were, though not without genuine elements, florid and dramatic: 'panic, sheer blind panic, you may take whatever you may be afraid of and multiply it a thousand times, and you'll never get anywhere near what it's like, everything looks different and seems different, and my face changes, I know, it gets set and long and my voice changes, very melancholy, sort of dirge, from one moment being full of enthusiasm

it becomes an effort to speak at all, and I pass huge quantities of water, and if it comes on at night it's like a delirium... Egyptian mummies all horizontal round the room, you know, done up in their wrappings....' At one time she would urge her husband to attend the theatre with one of her friends, so that she could play the part of Cinderella. At another time she would have fearful scenes, with screaming and fisticuffs. After operation she became quite a nice woman. She went around, did her shopping, stayed with friends occasionally, came up to London to out-patients, lost her obsessiveness, bought a dog, went to the cinema, was extraverted, affectionate, and steady. She had her hysterical moments, such as when out shopping one day with a friend she affected not to know where she lived, insisted her home was at her late mother's address, and that she was not married; but these were very short-lived. The greater part of the time—in fact, almost all the time—she was quite a sensible married woman who looked after her husband and her old father, enjoyed herself, and was a satisfactory citizen. Two years after operation she was more extravagantly vivacious than she had been a year before, and it looked as though her histrionics might return, but they have been satisfactorily controlled, and 3 years after operation there remains an attractive transformation from a nauseating and romantic sentimentalist to a hard-working, practical, and considerate woman, who actually makes allowances for a crotchety and irritable husband.

It must be noted that though these patients have been presented as the psychopathic personalities that they were, they all showed sustained moods of depression. Theirs were not conditions out of which they could have been brought by a good shaking, or by dousing them with a pail of water. It is true that by conversation they could be brought to brightness and that they were always interested in themselves, but they presented severe and unmanageable states out of which they could not be cajoled for long; they had effected an insidious extension of their personalities until they had reached positions from which, through habit and through altered circumstances which did not permit return, abandonment of their state had become impossible.

Thus, out of 6 cases who had single depressions on a situational or reactive basis, 2, though immediately improved by operation

in so far as they lost their depression, were not recovered; 1 relapsed into a state similar to that before operation though less florid; 1 might have been considered worse in that what little drive he had formerly shown was now reduced, so that, faced by an awkward situation created by marriage to a forceful woman who had carried him off when at his most unstable and almost against his will, he lacked the courage to return to it, or to undertake an alternative course of action. Four of the 6 patients, on the other hand, were recovered in that they lost their symptoms, though 1 of them later relapsed. Three of the cases, considering the illnesses and considering the material, showed excellent results.

In these cases there was no indication that the age, sex, or duration of illness was of consequence as regards relief from symptoms. The factors that determined sustained recovery were the drive and appetite for life that existed in the pre-morbid personalities. In those 2 cases in which the pre-morbid personality was the least satisfactory, there was the least satisfactory result; these had rejected life and retreated from it, and were too inadequate to muster themselves to enjoy it. Their illnesses were not the result of load, so much as of chronic inadequacy. In the case which recovered but relapsed, there was an intermediate personality; there was load as well as inadequacy, and as soon as she returned to a situation which increased the load, the inadequacy became the more apparent. The last 3 cases had much appetite for life and many positive characteristics, and their illnesses did not arise so much from any lack, as from an excess of affect which, ill-directed and ill-controlled, came to constitute a load.

None of the cases had been improved by previous treatment.

SUMMARY

(1) Eighty-five cases were taken to form the group of patients with affective disorders. Of these, 2 had had recurrent attacks of mania without depressive attacks, 16 had shown attacks of both mania and depression, 29 had had recurrent depressions without manic attacks, and 38 were operated on at one stage or another of the only depressive attack to which they had been subject.

(2) Of those subject only to manic attacks, 1 case died within a week of operation, and is classed as an operative death: the other persisted in mania after operation, though in modified form: he died within 3 months of an insidious physical enfeeblement probably related to accidental damage to the rostral connections of autonomic centres in the hypothalamus.

(3) Of the 16 cases who had shown both manic and depressive attacks, 1 died of heart failure shortly after operation, but the death was not considered attributable to surgery. Of the 15 survivors, 2 were already deteriorated before operation, and were among 6 cases who showed no substantial post-operative change, in that they continued to show manic attacks which, though of modified form, were such as to prevent discharge from hospital. Of the remaining 9, 1 swung quickly from depression into hypomania after operation, settled, and later had mild hypomanic relapses. One swung very slowly over a period of 18 months from a depression of 11 years' duration to a state of frank mania, such as she had not shown before, which persisted in the twenty-fourth post-operative month. One continued in a prolonged state of depression of a milder and much less agitated kind. Two recovered but later relapsed into hypomania. Another recovered but later relapsed into depression as well as into hypomania. Three cases have shown sustained recovery, in 1 of whom the attacks had always been very mild, and the other of whom has post-operative epilepsy.

(4) The post-operative form of illness was, however, so mild compared with the pre-operative, that no fewer than 7 of the 13 undeteriorated cases who survived operation were able to live continuously at home without returning to hospital. Attention is drawn to the fact that such relapses may be difficult to recognize for what they are on account of the reduction in talkativeness and activity compared with hypomania as ordinarily seen, and they may be manifested only by phases of pathological irritability, sometimes with restlessness. It is therefore probable that depression, often liable to be less obvious than hypomania, may post-opera-

tively recur more often than is supposed. The comparative rarity with which patients complain after operation, and the reduced emotion which they tend to show, may also contribute to the even greater difficulty of recognizing post-operative depressive relapse.

(5) There were 25 cases with recurrent depressive attacks, but without manic attacks, in which the illnesses were considered to be more endogenously than situationally determined. Some had long depressions with long remissions between; others were rapidly recurrent; 3 showed marked obsessional features, and another showed schizophrenic features.

(6) Of these 25 cases, 2 died, 1 from cerebral haemorrhage associated with hyperpiesis, 1 from obscure causes in the tenth post-operative month. Of the 23 survivors, all were discharged home. One, operated on at the age of 60 after a 12-year illness during which she had deteriorated, was not recovered, but showed an interesting combination of persistent depression masked by something approximating to euphoria (Case 57, page 141). The other 22 patients all recovered. The results in recurrent depressions without manic attacks were thus very much better than in those cases who had shown both manic and depressive phases. One of the 22 patients, however, entered hypomania in the sixteenth post-operative month which developed into frank mania at 2 years after operation; he had never had a hypomanic attack before.

(7) Taking the manic, manic-depressive, and recurrently depressive cases as a whole, the women did slightly better than the men, but not to a statistically significant extent. There was no correlation between recovery and the age at operation. There was no correlation between recovery and the age at onset of the first attack, but the figures suggest that the earlier in life the attacks had begun, the greater were the chances of post-operative relapse. There was no correlation between frequency of pre-operative recurrence and frequency of post-operative relapse, so long as there had been remissions of good quality between recurrences before operation. There was some correlation between the duration of illness and recovery, which suggested that the

chances of recovery were reduced when the illness had lasted more than about 3 years without remission. The presence of manic features was of unfavourable prognostic significance for treatment by operation, but not to the extent of forming a contra-indication.

(8) There were 4 recurrently depressive cases whose illnesses were considered to be situationally determined. All 4 recovered, though retention in hospital is preferred by one, and another (CASE 22, page 152) is of special interest in that she went through a post-operative paranoid phase with recovery.

(9) Of the 38 cases with single depressive illnesses, 21 were considered to be suffering from involutional melancholia. Two cases died shortly after operation, but the deaths were not considered attributable to surgery. Two more died, 1 of a second stroke, the other of bronchial pneumonia with heart failure, many months after and unrelated to operation. Of the 19 who survived long enough for study, 17 became well enough to live at home. Of those remaining in hospital, 1, after a 14-year illness, was substantially unchanged; the other, though not recovered, would have been fully able to live at home had the housing situation allowed. Of the 17 who were in fact discharged, 4 were not fully recovered; 1 suffered from cerebral arteriosclerosis with hyperpiesis, and post-operatively showed some hypomanic release, another showed extreme inertia with organic deficits following a second operation in an intentionally posterior plane, the third showed remnants of hypochondriacal querulousness, and the fourth showed traces of persistent depression by no means apparent except on careful inquiry. The remaining 13 recovered. The illnesses which showed fluctuations carried a better prognosis for recovery by operative treatment than did illnesses which were unremitting in form. As long as fluctuations could be obtained, through electroplexy or spontaneously, there was no correlation between the length of the attack and the subsequent recovery. Where there were no fluctuations, either spontaneous or therapeutically induced, the figures suggested that the chances of recovery were reduced if the

illness had lasted for longer than about 2 years. Response to electroplexy, however transient, thus seemed a favourable omen for treatment by operation, but failure to respond was not a contra-indication.

(10) Of 11 cases with single depressions which were considered to be mainly endogenous in type, 1 (who was hyperpietic) died as a result of operation, 1 was relieved but not recovered, 1 lost overt manifestations of depression but was left with a fundamental apathy. Eight of the 11 patients recovered. Seven of the recovered patients had had depressive symptoms for less than 3 years. Of 3 patients with depressive symptoms for more than 3 years only 1 recovered. Although these illnesses were considered to be mainly endogenous, they were influenced by situational factors to a more obvious extent than the foregoing cases. The more that such influence was obvious, the better were the results. The deduction was tentatively drawn that if depressive illnesses be viewed in terms of how much there is 'loss' (anergia, affective reduction, etc.) and how much there is 'load' (agitation, worry, etc.), the function of operation is to remove the latter, but to leave the former untouched except in so far as removal of 'load' may afford a more favourable *milieu* for recovery of what was 'lost.' Favourable response to electroplexy again appeared a favourable omen for operative treatment, though the converse was not the case.

(11) There were 6 cases with single depressive illnesses which were considered to be on a neurotic basis. One case was only temporarily improved, and relapsed into a state similar to that before operation though somewhat less florid. One case was doubtfully worse in that an already passive person was rendered more so by operation. The other 4 cases recovered, and 3 have remained at home for between 2 and 3 years, having resumed their previous lives, while the fourth relapsed after a year at work.

(12) Even the recovered patients showed deficits of some sort, but the degree of recovery attained was on the whole such as to render those of little moment when the pre-operative state is taken into consideration.

INCONTESTABLY SCHIZOPHRENIC CASES

One hundred and fifty-eight cases are considered to belong within the schizophrenic group, but they form so heterogeneous a collection that some sub-division is desirable.

Kraepelin divided dementia praecox (for which term Bleuler's substitution of 'schizophrenia' has now come into general use) into the hebephrenic, paranoid, and catatonic forms. To these Bleuler added a fourth, the 'simplex' type, and Kraepelin accepted the addition. Although Kraepelin later became dissatisfied with the simplicity of these concepts and formed a considerable number of further sub-divisions, these last are now generally held to lack sufficient virtue to compensate for the trouble of remembering them. The four classical forms are those now recognized in most terminologies.

Schizophrenia simplex is characterized by its onset in adolescence with an insidious falling off of attainments, by vague and scattered thinking, by an increasing withdrawal and introversion with indifference and lack of warmth, and by a deterioration in social behaviour.

Hebephrenia also starts early, and presents much the same picture but with the addition of such more florid features as states of excitement with mischievous conduct, together with hallucinations and delusions. The emotional response to these tends to be fatuous, so that the whole is stamped by a certain silly emptiness.

Paranoid schizophrenia tends to develop later than these; the greater wealth of content is striking, while the disintegration of personality and the withdrawn remoteness are less striking, than in the foregoing emptier forms.

Catatonic schizophrenia, also of later onset, is a more dramatic condition, often starting abruptly and marked by extraordinary alterations of behaviour from stupors with adoption of strange fixed postures and periods of negativism, to wild frenzies with impulsive assaults.

This classification, however, has certain drawbacks. Some of

the patients can be fitted into more than one of the sub-divisions, some into none of them. Further, there is a measure of descriptive disagreement between different writers, no doubt owing to the wide variations that are encountered, as to the sub-divisions themselves. For example, Lewis (1946) writes: 'In hebephrenia, the least common variety, delusions and hallucinations are inconsiderable, but abnormal conduct is to the fore....' Whereas Henderson and Gillespie (1945) say: 'Hallucinations of sight and hearing are particularly common in hebephrenics.... It is the vivid hallucinations which especially dominate the picture.' And both of these comment on the early onset, but Bleuler (1924) remarks: 'In the present conception of hebephrenia the age of onset is unimportant.... It now constitutes the big trough into which are thrown the forms which cannot be classed with the other three forms.'

It is proposed here, therefore, as we are dealing with a symptomatic treatment in the decision to use which the diagnostic label is of comparatively little consequence, to use an even simpler classification. We shall take as our first group those patients who are incontestably schizophrenic in a general sense. The criteria are that they would be recognized as falling into that general category, and falling into it unreservedly, by anyone who had served in a mental hospital for 6 months as a medical officer: that such recognition would be achieved within, say, 20 minutes' conversation with the patient, or by a morning's observation without speaking to the patient at all (though in most instances the diagnosis would be reached in much less time): and that such recognition would be amply confirmed by perusal of the case papers.

These were the dishevelled patients, often wet, dirty, hoarding rubbish, sitting hunched up muttering to themselves and punctuating their soliloquies with sudden loud responses to hallucinatory voices, or standing statuesque in strange attitudes immobile for hours with blue extremities, or with faeces in their hair roaring obscene abuse from padded cells as they complained of electrically mediated sexual assaults, or mute and peering vaguely between spells of fatuous giggling. There were 77 patients in this group, of whom 12 were sufficiently preserved to sustain a conversation with reasonable fluency.

One patient said that she was unique, with special powers so that she could control the flight of birds, and was able recently, by a magnetic property of her eyes, to compel a spider in her room to look this way and that according to how she looked herself. She had a long history, of which she could give no account, of stupors with intermittent violence; at home she had one day smashed everything breakable in the kitchen and had tried to stuff the remains in the water closet, in which she had sought also to dispose of a dog. Then, as we looked from her bedroom window over the wonderful view of the Wye, dappled in the sunlight, she felt she could control the movements of the morning mist.

Another, when asked how she felt, said, 'Well, I gave birth to a holy child a week ago to-day, and so I don't feel very strong. He was happily born in heaven.' She had been in the hospital for some years. She left this theme, and said, 'You're done up like father. He was taken into a mental hospital and used. They made him into a god. There were great stores of ammunition there, and father gave Hitler a great shock.'

A third (CASE 195, page 209), when asked his name, said, 'Jesus Christ.'

Q. 'What do they call you here?'

A. 'Bill Davies.'

Q. 'How old are you?'

A. (*crossly*). 'I've told you who I am.'

Q. 'But what year were you born?'

A. (*sulkily*). 'Year nought.'

Q. 'How old do they say you are here?'

A. 'Twenty-five.'

He went on to say that he was the atomic man, who died when the world became atomic, that Greta Garbo stands behind Lindbergh as the atomic god, that he was a psychiatrist and had a pain in his head which is God the Father. At the end of the interview he said, 'Oh, don't go; please, don't go; it's so nice to have someone intelligent to talk to.'

A fourth, seemingly a boy of nearly 70, told charmingly of a great heavenly schooner which plies between his hospital and Egypt, whither the patients are transported, are made well, and enter Paradise, at £50 a trip. It is always his turn next, but mean-

while celestial women visit him at night, and the millennium is at hand. He was extremely noisy, especially at night, when he shouted responses to messages from heaven. He had been in hospital for nearly 30 years, since an attempt at self-mutilation.

A fifth was interrogated as to his habit of persistently drinking urine, both other patients' and his own. 'Well,' he said with schizophrenic simplicity, 'father always said I ought to drink plenty of water.' Asked if this were the real reason, he replied, 'Well, there are too many people about here, and I think if they think I'm mad, they'll bugger off and let me alone.' Asked if there were no other reason, he answered, 'Oh, no, otherwise I'd just drink it out of a cup like the normal person.'

These descriptions of and conversational samples from these patients should suffice to indicate that they were truly schizophrenic, when it is also borne in mind that their past histories are in line with such a diagnosis. Yet we have not been quite honest, for there was among these 12 better preserved patients in the total group of 77, one who was not at first sight obviously insane at all, but who is included here for convenience (CASE 182, page 208). He was a doctor, certified, with just enough insight to know that other people thought him ill and therefore to make him guarded and evasive. He denied that he was in any way unwell, and though in a moment of frankness he spontaneously reverted to the topic of hallucinations and seemed about to discuss it, a slow, sly smile crossed his face, he all but giggled, and then became aloof. He was affectively shallow and curiously detached. But he had told his mother that he was under telepathic influences, that his thoughts were answered by voices which took up the theme of what he thought: and his history showed moodiness, with a singular taciturnity punctuated by bouts of sudden violence. He was, in fact, a dangerous man. Post-operatively, it may be noted, he was at first more accessible, and discussed his hallucinations at some length with greater insight.

There is no doubt that this patient belonged to the incontestably schizophrenic group. The only difference between him and the other 76 patients of the same group is that his condition was not so far advanced as to be unmistakably and immediately obvious.

We will now consider the results.

Deaths. There were 3 operative deaths from cerebral haemorr-

hage, and a fourth from epilepsy. A fifth patient died 21 months after operation from obscure causes.

Epilepsy. No fewer than 15 of the patients who survived operation had epileptic fits after it. Two of these had had them with much the same frequency before, but the other 13 now showed epilepsy for the first time.

(1) One of these 13 died after a fit in the eleventh post-operative month. After some initial improvement from a catatonic state, in that he shewed greater accessibility with increased rapport and greater steadiness of conduct, which enabled him, though by no means free from psychotic ideas, to be employed on working parties in the grounds, his behaviour steadily deteriorated after a fit in the fourth post-operative month. He had 3 fits in succession in the fifth month, 4 in succession in the sixth, 7 in succession in the ninth. He had become obscene, abusive, and easily excited. In the eleventh month he had two bouts of sudden maniacal excitement which looked like epileptic equivalents, and a final fit after which he entered a coma and died. It is a question how far the electroplexy which he was given with a view to controlling the excitement may not have contributed to the development of the fits (see page 27).

(2) One patient entered status epilepticus in the fifth month, but despite absence of medication had no further attack in the ensuing 24 months.

(3) One patient had single fits in the fourth, fifth, seventh months, 4 fits in the ninth month, and single fits in the fourteenth, seventeenth, eighteenth, and twenty-first months. He received no medication.

(4) One patient had 2 fits in succession in the sixth month following treatment by electroplexy, but in absence of the latter had fits in the eighth, tenth, and eleventh months, and several others since. He received no medication.

(5) One patient had 3 fits, in the first, second, and third months respectively. He was then given medication and had 4 further attacks in the ensuing 19 months, one 5 days after medication had been temporarily stopped.

(6) One patient had 3 fits in the nineteenth month, while

receiving electroplexy. He had no medication and no recurrence.

(7) One patient had 2 fits in the same day in the twelfth month, but in absence of medication had no further attack in the ensuing 12 months.

(8) One patient had 2 fits in the second month while receiving a course of electroplexy. In absence of medication he had no further attack in the ensuing 22 months.

(9) One patient had 1 fit in the third month and had 4 at irregular intervals since. She had had a second operation, but no medication.

(10) One patient had 1 fit in the sixteenth month, and despite medication had another in the eighteenth month.

(11) One patient had a single fit 3 weeks after operation. In absence of medication she had no further attack in the ensuing 27 months.

(12) One patient had a single fit on the first post-operative day, but in absence of medication had no further attack in the ensuing 26 months.

(13) One patient had 3 fits in the same day in the tenth and again in the fifteenth month after a second operation.

The figures are inconclusive as regards the effect of medical treatment on the epilepsy shown by these patients. Eight patients had recurrences of fits though 2 of those 8 were taking medication. Three patients had only single fits though none of them took medication.

There is no definite evidence of an epileptogenic influence arising from electroplexy, but the possibility must be borne in mind.

Of the 74 patients to survive the operation, 41 were men and 33 were women. It may be significant that of the 13 developing post-operative epilepsy 9—an unduly high proportion—were men. No factors such as heredity, previous head injury, or alcoholism were found to account for this. Of the 4 women who developed it, one had only a single attack on the first post-operative day, and no others: one had only a single attack in the third post-operative week, and no others: the third and fourth patients had had 2 operations with, therefore, the greater opportunity for intracranial damage: the latter had survived the first

operation without a fit despite an electro-encephalographic rhythm known pre-operatively to be unstable. Further, there were in this group 4 patients, all women, who had had isolated epileptic attacks before operation at one time and another. Though an epileptic tendency might have been supposed to exist in these, none has so far developed post-operative epilepsy. These findings would suggest that pre-frontal leucotomy is less likely to provoke epileptic disturbances in schizophrenic women than in schizophrenic men.

Clinical State of Patients Still in Hospital

(*a*) *Substantially improved cases.* Of the 74 cases who survived operation, 48 (or about two-thirds) remained in hospital. Of these 48, there were 2 who had shown really substantial improvement. The extent of this can be indicated by saying that, as far as can be gauged from the limited test of mental hospital life, it would have appeared quite feasible for them to live in the outside world in sheltered circumstances. They would not have been able to manage their own affairs, but they would have been able to live with relatives at home, or even in a hotel, and to have looked after themselves satisfactorily as far as personal hygiene and enjoyment were concerned. They would not have caused social embarrassment, and would probably have been able to pay visits by themselves to relatives or friends. But it would have been unthinkable to place reliance on them in any important matter.

Case 127. A woman aged 31 had a history of 28 months' illness with abrupt onset in which she had become distraught and restless, mistook people for German spies, insisted that she had seen Dr. Goebbels, and acted in general as though she were followed by enemy agents intending her harm. She repeatedly believed complete strangers to be people whom she knew, and would frequently be stimulated to violence by the tricks which she felt were being played upon her. She thought she had come to work at the hospital (whither she was sent as a certified patient) as a V.A.D. She knew that her brother, her children, and their nurse were in the hospital because she heard their voices; she believed Mr. Churchill to be in the bathroom and the Archbishop of Canterbury to be in the female disturbed ward. She was sullen, hostile, and morbidly suspicious with outbursts of dangerous violence. Between being

withdrawn and angrily aloof she would dismantle her bed and use it as a battering ram, or would smash her hands through panes of glass. She was slovenly and dirty, violently resistive of nursing attention, and kept her room in the utmost disarray. Occasionally she would giggle inappropriately and be momentarily amenable, but these would be only the briefest interludes in an aggressively hostile campaign. An attempt to start her on insulin treatment evoked stormily resistive scenes as did any other suggestion, except that she accepted a course of penicillin injections which did not affect her condition in the least. *After operation* she was at first facile and rather fatuous, with enormous reduction of her suspiciousness and increase of accessibility. For some months she still mistook identities, even of people with whom she had associated constantly for more than 2 years, such as her doctor and members of the nursing staff. She was also disorientated in time but not in place. She believed herself to be under hypnotic influences. She was quite vague about her past, thinking she had been married 'about 6 years' when her husband had already been dead for 7, uncertain of the names of her children, and disinterested as to whether her husband were alive or not. She did show, however, considerable improvement in her conduct; she was friendly and amenable, looked after her personal hygiene though occasionally incontinent of urine owing to post-operative urgency, kept her things tidy, adhered to the routine, attended occupational therapy classes and hospital entertainments. *Six months after operation* she had made further superficial improvement. She only occasionally mistook identities, and was more correctly though imperfectly orientated in time. She believed herself some years older than she was and thought her operation had taken place a year ago. Her mood was one of placid acceptance. She denied both passivity feelings and auditory hallucinations, but readily admitted having experienced these, gave some description of them, and attributed them to illness. She had no real grasp, however, of why she had come to hospital and still believed she had originally come in order to work. She knew the names and ages of her children, where they were and in whose care, and wrote them reasonable letters as part of a regular correspondence which she conducted with her family. She was not otherwise interested in their welfare, however, and was not in the least distressed by her state of doubt as to whether her husband (killed 4 years before her illness began) was alive or not. She could give a reasonably correct account of her past life up to her illness but was not in the slightest degree concerned about resuming it. She participated fully in the

hospital routine. *Twelve months after operation* she remained much the same except that she was more active, worked regularly in the gardens and at sewing, played whist and bridge though badly, played golf, and read a fair number of books of which she could give a superficial account which did not, however, bear any penetrating examination. Although she knew the date and time, she was still very imperfectly orientated, now said incorrectly that she had been admitted to the hospital on a previous occasion for ophthalmic treatment, denied that she had been ill at all, said she had been sent to hospital to have an operation but wasn't quite sure if this had been performed or not. She rather thought her husband had been killed in the war, but was not certain and was disinterested. Her rapport had none the less improved; she was less off-hand on the whole and showed a good deal more interest. Her energy was not great and she was ready for bed by 7 p.m. She no longer had urgency of micturition, but had slight frequency. *Twenty-four months after operation* she had ground parole of which she took full use, worked hard starting at 7.30 a.m. in the ward and continuing in the laundry, could reliably carry out routine tasks, and her social conduct left nothing to be desired. Her improvement was entirely confined, however, to her conduct. She was still disorientated in much the same way in time, and she had displaced various events such as the operation, which she believed to have been contemplated but not carried out, as though they had nothing to do with the hospital but had happened at her home before the question of hospital arose. Her hallucinations, similarly, she said she had heard only at home where, she incorrectly said, the hospital doctors had come to see her. She believed that various people whom she had known socially, including some relatives, had worked in the hospital although she agreed they were no longer doing so. She still denied that she had ever been ill. Thus, though she still had some distortions of content, these were related essentially to the past and there were no delusional formations about current events. She did, however, show thought disorder though not in very obvious form. Her increased interest was applied only to her immediate surroundings. She named her son's school wrongly, though so nearly correctly as to enable the interviewer to understand what she meant, and she wasn't sure if her daughter had changed her school or not. Her sensorial powers showed marked deficit and had not altered over 18 months. She could repeat 8 digits forwards, but could reverse only 4; she could recall correctly 5 items out of 6 after 5 minutes; she could retell a simple story correctly; she could interpret proverbs without gross

literalness, yet not in a normally abstract way; she could perform neither addition nor subtraction of money correctly. She was an attractive and pleasant person, hard-working and able to attend to her immediate environment; seen in reasonably sheltered circumstances she would pass as normal as long as there was none but superficial conversation.

CASE 171. The second case to have shown a substantial degree of recovery was a girl of 31, unmarried, with a 9 years' history of established illness preceded by an insidious onset. At first the manifestations were confined to behaviour, poverty of volition, shallowness of affect, grimacing, and erratic conduct. There was marked improvement with cardiazol, but relapse as soon as the treatment was stopped. No distortions of content were elicited, however, and the patient actually persuaded her parents to allow her to go to India for a visit. There she was moody and unpredictable and on the return journey attracted enough attention for her parents to receive warning from the ship that she was unwell. On disembarking she disappeared without warning, but was found in a seaside resort. She was evasive, mainly mute, given to grimacing, with poverty of ideas and of affect. When certified she became fearful, emotionally labile, very resistive, and inaccessible. She received 61 insulin comas without effect. Six months later (3 years after the onset of the illness) she became more accessible, and was found to be vague, ambivalent, basically paranoid with scattered thinking. Soon after this she became dominated by auditory hallucinations, with many delusions and misinterpretations with some excitement. She was treated by electroplexy at first with some effect, but after 45 treatments she began to deteriorate and gradually became noisy, destructive, and homicidal. She received orders from Mr. Churchill that she should smash the windows, which she did again and again and again. Five years after the onset of the established illness she was given 6 further treatments with electroplexy. There was again improvement which was not maintained, and the patient returned to a restless, erratic, and noisy state with shifting hallucinations and delusions, messages from the King, beliefs in nudism and Christian science and the white slave traffic, culminating in an escape by knotted sheets which resulted in serious injury. She resisted treatment, but recovered in spite of herself, to remain destructive, emotionally labile, grimacing, laughing, weeping, noisy, impulsive, and hostile for the next 3 years. Her improvement after operation followed essentially the same course as that of the case previously described, except that after 2 years her sensorial performance was

slightly better and she could calculate money correctly on paper though making mistakes in her head; she was also fully informed about her relatives (as to whom she was still making mistakes 12 months after operation), and had some insight. But she showed the same sort of disorientation and displacement of events in time, with evidence of thought disorder if this were looked for, and she tended to laugh a little more loudly than she need, to have a little less social finesse and a less assiduous application to the duties of hospital routine.

(*b*) *Markedly improved cases.* There were 5 cases who were markedly improved, in the sense that they had become co-operative, amenable, and 3 of them useful, instead of being a continual nursing problem, but their recovery fell short of the feasibility of discharge from hospital.

CASE 138. A 45-year-old man, ill for 28 years and certified for 26 of them, was continually impulsive, quarrelsome, and violent except for 1 week in 1932. He smashed windows and crockery, attacked other patients and nurses, was resistive to attention, noisy, irritable, angry, stealing other patients' food, and incontinent of urine. He could not be left alone for a moment. When seen he protested emphatically and unintelligibly against everything. He spoke at high speed with bewildering change of content and a number of neologisms. His attention could not be gained as he was insisting that he was not an electric train, while he also saw Lord Nelson sitting both on a commode and on the roof of a neighbouring building, and was entirely preoccupied with his own stream of thought. Few of his remarks were intelligible. His left hand was bandaged where he had that afternoon pushed it through a window. His attitude was vaguely threatening and hostile. This was characteristic, though the push of talk was not, and was an excited reaction to being obliged to interview a newcomer. *Six months after operation* he was no longer impulsive or violent, neither a window-breaker nor a food snatcher. He was liable, however, to be incontinent of faeces as well as of urine. But he could be left alone without trouble. He was quiet, allowed himself to be examined, and did not speak unless spoken to, when he would answer in more or less appropriate terms though the answers were always unreliable and often meaningless. Asked about Lord Nelson he said: 'He's a fellow at the Admiralty, valuable man.' *Twelve months after operation* he was fully and neatly dressed, an established occupant of a convalescent ward, co-operative, amenable, and pleasant, no longer incontinent. He rose

from his armchair, shook hands, and behaved appropriately. He said nothing spontaneously. He was orientated for place and person, but entirely disorientated in time, saying that he was about 35 and had been in the hospital about 4 days. Distortions of content though undoubtedly present were difficult to elicit. He denied hallucinations, and when told that he had been previously observed to be experiencing them, he replied politely but very firmly that there was some mistake and that he was being confused with somebody else. When asked about Lord Nelson he said that he had died about 1870, and was uncertain whether he himself had known him or not. This case represented a very real easing of the nursing burden.

CASE 173. A sub-human patient of 51, under certificate for 25 years, during which he had been continually unemployable, destructive, hostile, combative, sly, cunning, wet, dirty, and thieving, with the commission of an act either of destruction or violence almost every day, would reply to questions with a few audible and appropriate (if inaccurate) words before his answers degenerated into a low unintelligible mumble. He had an extensive dermatitis artefacta due to picking and rubbing. Shirt tails heavily contaminated with faeces hung out from dishevelled trousers. His torso was covered with strong clothing to prevent destruction. He lolled about the ward doing nothing, but tended to strike anyone who came within reach. This was no doubt related to what was found in accessible moments, that he was much preoccupied with having been in his army days a boxer of renown. Within a month of operation his incontinence had stopped and he had started to pay attention to his personal appearance. *Six months after operation* he appeared quite smart, worked steadily as long as he was kept under supervision, had not raised his hand against anyone, had destroyed nothing, and was in no sense a nursing problem. His dermatitis had cleared. At interview, he showed echolalia and perseveration, but would answer questions briskly in a firm tone, though continuing his low mumbling after he had given the answer. He was disorientated in time, but orientated for place and person. He could give some account of himself though an unprecise one. He knew the date and month, but not the year. He could retain 6 digits forwards and 3 backwards, but failed entirely on other sensorial tests. *Twelve months after operation* he showed some initiative. He attended to his personal hygiene without prompting. He worked steadily, rolling the cricket field and cleaning the church. His original military training had been exploited adroitly by the nursing staff and he had become almost soldierly. At interview he was a smiling, amiable man who stood

slightly better and she could calculate money correctly on paper though making mistakes in her head; she was also fully informed about her relatives (as to whom she was still making mistakes 12 months after operation), and had some insight. But she showed the same sort of disorientation and displacement of events in time, with evidence of thought disorder if this were looked for, and she tended to laugh a little more loudly than she need, to have a little less social finesse and a less assiduous application to the duties of hospital routine.

(*b*) *Markedly improved cases.* There were 5 cases who were markedly improved, in the sense that they had become co-operative, amenable, and 3 of them useful, instead of being a continual nursing problem, but their recovery fell short of the feasibility of discharge from hospital.

CASE 138. A 45-year-old man, ill for 28 years and certified for 26 of them, was continually impulsive, quarrelsome, and violent except for 1 week in 1932. He smashed windows and crockery, attacked other patients and nurses, was resistive to attention, noisy, irritable, angry, stealing other patients' food, and incontinent of urine. He could not be left alone for a moment. When seen he protested emphatically and unintelligibly against everything. He spoke at high speed with bewildering change of content and a number of neologisms. His attention could not be gained as he was insisting that he was not an electric train, while he also saw Lord Nelson sitting both on a commode and on the roof of a neighbouring building, and was entirely preoccupied with his own stream of thought. Few of his remarks were intelligible. His left hand was bandaged where he had that afternoon pushed it through a window. His attitude was vaguely threatening and hostile. This was characteristic, though the push of talk was not, and was an excited reaction to being obliged to interview a newcomer. *Six months after operation* he was no longer impulsive or violent, neither a window-breaker nor a food snatcher. He was liable, however, to be incontinent of faeces as well as of urine. But he could be left alone without trouble. He was quiet, allowed himself to be examined, and did not speak unless spoken to, when he would answer in more or less appropriate terms though the answers were always unreliable and often meaningless. Asked about Lord Nelson he said: 'He's a fellow at the Admiralty, valuable man.' *Twelve months after operation* he was fully and neatly dressed, an established occupant of a convalescent ward, co-operative, amenable, and pleasant, no longer incontinent. He rose

less trouble. It might be imagined that, denuded of such vestiges of individuality as remained to them, they showed a semblance of improvement only because further loss of function had reduced them to the status of a vegetable. But this was not the case.

They were still able, in much the same limited way as before, to look after their interests, to protect themselves, to guard such scraps of belongings as they might have, and to resist—for instance—being taken out for exercise, if the mood for resistance was upon them. Nothing has been seen among these patients comparable with Cid's (1937) description of a patient who would not even retaliate when struck. And if the operation has set some limit to their assertiveness or has reduced their resistance to social demands, it has also given them something back. It has extended such brief periods of amiability as they may have shown before, it has afforded them choice of staying in their padded cells or taking the air for a change, it has given opportunity for resuming recreations which they once enjoyed. No fewer than 14 of these 23 patients had resumed pastimes from which their illnesses had long debarred them: sewing, embroidery, music, billiards, lawn-tennis, occupational therapy of various kinds, and being taken out by relatives. All these had become possible in one case and another, and even such modest activities demand active co-operation; they are not undertaken through sheer reduction of vitality. Incidentally, 18 patients previously incontinent of both urine and faeces had fully regained their control, 2 more had become incontinent of urine only, and 6 previously incontinent of urine had become dry. The incontinence of 6 had remained unchanged. Three previously controlled had become incontinent of urine, and another had become incontinent of both urine and faeces.

(*d*) *Unimproved cases.* Next there were 15 cases who were unimproved, or so slightly better that the gain was negligible, both from other people's points of view and from their own.

(*e*) *Cases worse after operation.* Finally, in our consideration of those patients who remained post-operatively in hospital, there were 3 who might have been considered worse. One of these, with 12 years of frank illness with a long insidious onset prior to that, with years of mutism spent in a fixed attitude of prayer seemingly through an identification with St. John the Baptist, was worse only in that she became incontinent of urine,

firmly to attention. He showed no echolalia, and he did not per-

He had written several simple, but intelligible letters to his relatives, including some to his mother although he had been told that she had died. His sensorial powers were not improved, and he had no insight. He was rustically simple. Two years after operation both these cases had maintained their improvement.

The other 3 markedly improved cases show much the same degree of change, though ill only for 17 years, 32 months, and 18 months. All had been combative, noisy, and hostile. Although they looked after themselves satisfactorily within the framework of the hospital routine, it was not felt that they would make a satisfactory adjustment without the pressure of mass example or the imposition upon their lives of a definite schedule with its maintenance backed by authority.

(c) *Slightly improved cases.* There were a further 23 patients who had improved to an extent which had rendered their nursing care appreciably easier. This must certainly not be taken to mean that they were, or were likely to become, in any way near to recovery. It was incidentally felt possible that 2 of them might conceivably reach something near that level, even though more than a year had passed since operation, but they were still disturbed patients, and so were the other 21. They had, on the other hand, been altered from being combative, in some cases tormented, distraught, and overwhelmed by distressful deluge, in other cases vicious, destructive, and predatory, to being quiescent, amenable, and reasonably behaved. This change had not taken place to the extent that they could be left on their own, for they were still possessed by their illnesses. But it had taken place to an extent which allowed relaxation of constant vigilance, which rendered their resistiveness to necessary attentions less exacting, and which made them potentially less dangerous and exasperating to their associates. Eighteen of these patients were in the most disturbed wards of their respective hospitals, and 13 of them have since been promoted.

A question that must be raised here, of course, is whether these patients are said to be improved only because they caused

Clinical State of Patients Who Left Hospital

Twenty-six of these incontestably schizophrenic cases left their hospitals at one time and another. Yet this number is less impressive than it may sound.

(a) *Cases who left against advice.* The removal of 5 of the patients—by importunate relatives against advice—was a victory of family loyalties over reason. Three of them were returned forthwith. The fourth, by one of her more sensible acts, returned herself, though she undertook the 80-mile journey without confiding her intentions to anyone; she was again removed 2 weeks later, in a vacant hebephrenic state, in which she continues. The fifth patient, the atomic man (Case 195, page 196), worked at 3 labouring jobs for 3 or 4 days each, but preferred to spend the daylight hours drinking tea in a café, and the evenings in alcoholic excess. His former associates regarded him as remarkably altered, but they would have been surprised to learn that he believed himself to be Christ and the recipient of repeated (but hitherto harmless) messages from Colonel Lindbergh and Miss Garbo. He was erratic, inconsiderate, and uncouth, in contrast to his pre-morbid self. He was an uneasy addition to family life, but not unwelcome apart from occasional nocturnal incontinence. He was returned to hospital after 5 months.

A sixth patient was an alarming example not only of the possible pitfalls of follow-up by correspondence, but of the risks which an unsuspecting public may run, though not discharged against advice.

A youth of 23, 6 months after operation, was described by one of his relatives as a remarkable cure. 'It is miraculous,' she had cried, as she dramatically threw open the door to reveal a remote, withdrawn, hunched, dishevelled schizophrene, neglectful of hygiene, detached from reality, teeming with delusions, ideas of reference, and sadistic phantasies. 'How nice it would be,' he had said reflectively to his mother, 'if I were to cut off one of your shell-like ears, and then to beat you up. How you would enjoy it.' He had remarked also on the pleasures of having an accident with the car, which, rather startlingly, he was encouraged to drive. Seen 12 months after operation, he had taken to living mainly in one room (hermetically sealed against the neighbours' powers of thought-

from which by constant vigilance she could be kept before. *Another, a frank paranoid schizophrenic for 5 years, extensively* disorganized, was no longer combative or a source of anxiety to those around her, but had deteriorated into a softer, more dishevelled, more remote person, with less accuracy both in her perceptions and in their integration into the texture of her psychosis. The third was the doctor (CASE 182, page 197) of whom separate mention was made as having given an appearance of pre-operative preservation. He was improved after operation *for about 6 months, but since* then has steadily deteriorated. A course has been run, starting with a schizoid personality and i[illegible] developments and c[illegible] fatuous giggling rising to crescendoes of gusty laughter, with wild, impulsive assaults, and almost total lack of contact with reality. That this deterioration is not so much a result of the operation as having occurred in spite of it, is suggested both by the initial post-operative improvement, and by the fact of an almost identical illness having but a little earlier overwhelmed his younger brother.

If these 3 cases are the worst that the operation can do, it would seem a matter for little fear. It is the worst that the operation has been able to do in this group of 77 cases of fully developed schizophrenia.

In our survey of these 77 cases, we have now considered those 48 survivors of the operation who remained in hospital. We have seen that 2 were very substantially improved to an extent which would have rendered it feasible for them to live at home in sheltered circumstances, that 5 were markedly improved, that a further 23 were improved to an extent which appreciably eased the nursing burden, that 15 were unimproved or virtually so, and that 3 might have been considered worse. In one of those 3, however, the deterioration consisted only of urinary incontinence, avoidance of which had formerly required diligent attention: in another the deterioration appeared due to the illness rather than to the operation: in the third, such deterioration as there was was not unaccompanied by gain.

We come now to consider those patients who left hospital.

nap in the afternoon, and retiring to bed at 8.30 or 9 p.m. She made her own bed without being asked to and helped with the housework spontaneously and efficiently. She said very little, and what she did say was, of course, always about the hospital. She would read whatever lay to hand, including the most elementary children's books. She only once in six weeks showed the initiative to go out on her own, when she unexpectedly disappeared for some hours, but returned. When taken out she was naïvely excited by what she saw and at first tried to steal from shops. But indoors she was very vacant. She was sometimes unpredictable: when her small niece complained of a pain in the nose, the patient wished to treat this by insertion of a knitting needle; when a tile became loose from the fireplace she told the child to bake it on the gas-ring; once, when she was to be taken out, she merely put a coat on over a slip and considered this an adequate costume; she also raided her brother-in-law's bedroom one night with cat-burglar stealth, and borrowed his cigarettes and a lighter since they would not let her have matches through fear of fire. She was not over-nice in her toilet habits, and her excessive appetite caused her literally to lick her plate clean at meals, while once she also ate the cat's dinner. It was often necessary to rebuke her in front of the children; she much resented this, would say, 'Then to hell with it' in animated fashion, and would become stubborn. Withal this, she seemed free from distortions of content, though she was disorientated in time and had only small insight. Her thinking was scattered and she could be made rather confused, showing Goldstein's 'catastrophic reaction,' which was felt to be a product of frontal lobe damage rather than a residuum of the psychosis. She was a very simple person. Since the children were rendered uneasy in inverse proportion to their age by this strange new aunt, since she was a tie on the family, and since she returned her sister's kindness by saying she preferred mental hospital life ('I used to have a grand time, I used to have buns and a kipper for tea'), she went to a neighbouring hospital as a voluntary patient after 6 weeks' trial.

The other 7 patients have remained at home for periods ranging between 12 and 30 months. Two of them were far from normal, in that they retained a fundamental apathy so that they required stimulation to look after themselves and retained schizophrenic mannerisms. They were well enough to go out on their own, walking or by bus, to attend the cinema and football matches. But they had in general to be supervised, and there were capital objections to their being usefully employed in that neither would

reading and telepathic influence), access to which could sometimes be gained by parley through a locked door. Inside was a considerable stock of books and gramophone records, amid which the patient sat immobile, naked apart from a dirty dressing-gown. There was a large hole in the floor caused by burning, which extended not only through the carpet and drugget, but right through the floorboards into the space between these and the ceiling of the room below. The patient was much concerned with evil influences largely connected with the B.B.C., and was vexed by the hostility of a world united to deride him. Any window with a glimpse of a neighbouring house was therefore heavily curtained. He made some uncomplimentary remarks about a man who, in the absence of the parents abroad, was looking after him. This man told me that the hole in the floor had been caused by some casual upset of an electric stove, which the patient had then not bothered to get up and switch off. He adhered to this view despite being told that the patient even before operation had tried to set the house on fire. He also admitted that the patient had had two accidents driving the car, since almost announcing his intention of doing so. The first was trifling; the second was less so. But he saw no significance in these. 'He's always *saying* he'd like to do these things,' he patiently explained, 'but he never does them. He's always *saying* he'd like to beat me up.' Licence in this direction had extended only as far as allowing the patient, in a sort of uneasy fun, to grip his mentor round the neck. The latter had also collaborated in choosing a suitable knife from the kitchen cutlery for the fulfilment of sadistic fancies against himself. It was reminiscent of Mr. Shaw's remark: 'Bravery is a form of stupidity.' A year later, though rather more active, he was much the same.

Of these 6 patients, 4 were improved somewhat in conduct, and 2 were unaltered.

(*b*) *Patients discharged on trial.* Next, there are 8 cases whose discharge was a perfectly reasonable experiment in that, though still psychotic, their hospital behaviour was of a quite acceptable kind. In one the experiment was unsuccessful, but in less difficult conditions she would have had some chance.

A 38-year-old woman, after 12 acutely disturbed years in a distant hospital, was taken into the care of a sister. She found the outside world bewildering, and to live in small premises with 5 total strangers and a sister whom she had hardly known made excessive demands on her powers of adjustment. She was very inactive, getting up at any time between 11.30 a.m. and 1.30 p.m., taking a

been ordained in heaven that he should have been in the mental hospital for just such a length of time, which he knew through divine revelation granted to him before certification. These facts he told in confidence, and his family was unaware of them. He remained, however, immensely improved: an alert, active, good-humoured youth, interested in life though mainly in its pleasures, contrasting strangely with the lost and bewildered, inaccessible figure submerged under religious rumination and conflict, and breaking out into sudden and violent, if ill-directed, aggression, which he had remained for nearly 2 years.

The sixth patient, violent and disturbed also for nearly 2 years, behaved satisfactorily in a sheltered life at home, with exemplary social conduct. Hallucinatory voices gave him benign guidance from time to time over small points of everyday behaviour. But in other respects life was made difficult for him by the necessity, no longer so urgent, of establishing which of two kinds of understanding (the right, or the left upper) was dominant in the people whom he met. This was crucial for him, since on the answer depended the key to their character, and therefore his own interpretation of what they said. Much of the time he was able to neglect this, but it was occasionally pressing, though his social sense was such that it became a major issue only within himself and led to no outward contretemps.

The seventh patient, a 47-year-old woman with extensive paranoid ideas and much secretive hostility, given to long periods of brooding silence with occasional muttering to herself and angry answers to hallucinatory accusations, interrupted by periods of communicativeness in which she would be not violent but angry, returned home after 5 years to live with her widowed mother. She retained some delusions, but they were all in the past. A mysterious conspiracy had been on foot against her in the town, but it no longer existed. Those unknown but sinister figures who had engineered it for their unfathomable ends, watching and spying, circulating slanders and organizing secret signs, must now have left the town. She led a life so dull that one wonders what inspired her to continue with it. She was, as always, asocial and aloof; she occupied herself with the shopping, reading the newspaper in a lacklustre way, paying occasional visits to her cousins, and tending her little house. She had a trip to the vaudeville every now and then, and saw the films occasionally without animation but seemingly with pleasure. Her mother found her sane, but restless, and though not a kindly and considerate daughter, yet preferable in being less angular and more

stay at any task for more than a few minutes at a time, while one of them had post-operative epilepsy. Each had remained in hospital for more than a year after operation, and in each case the pressure on hospital beds had been a factor in determining the discharge. The remaining 5 patients who were discharged on trial were, on the whole, more successful.

One was markedly useful about the house, preparing and getting [illegible] g cupboards, [illegible] d the cinema [illegible] and whist-drives. He retained many past delusions, developed intermittent preoccupations about sex and the sinfulness of war, was farouche and asocial and liable to show surly ill-temper for 2–3 days at a time at irregular intervals (usually in response to embarrassing therapeutic efforts directed by his mother at his occasional urinary incontinence), after which he atoned by acts of special consideration. He refused to try outside work, and would probably have been unemployable, though when asked he always said that he intended to return to seafaring. He could not have been considered an added amenity, but family feeling and his domestic usefulness to old parents made it preferable for him to remain at home. He had had 5 stormy years as a catatonic schizophrenic: his bouts of wild violence had, however, been on the decline for the 2 years prior to operation. The latter none the less evoked great improvement, which was maintained.

Another worked for his father at market gardening. But he was erratic and would not have been tolerated by an ordinary employer. [illegible] his could not be [illegible] ile, but left his [illegible] He too had had a motor accident, but only through an error of judgment. His leisure hours he spent dancing, at football matches, and sometimes reading. He attended church and sang in the choir. At home he was noticeably coarser than formerly in that he was less careful in what he said, used bad language on small provocation, was not thoughtful for others, and said what came into his head. Yet, that was not always so, for he concealed the products of his psychosis. Beneath an appearance of behaviour which he kept within reasonable bounds, he was still the subject of telepathic influences, and heard commands spoken to him at a distance by his friends, while girls at dances could read his mind and know in advance when he was going to approach them. He had no insight into his illness at all: and none into his improvement. He believed it to have

continue at home. We come now to consider some patients on a slightly better level.

(c) *Patients without distortions of content, but retaining some psychotic stamp.* There were 7 patients nearer to recovery than those in the foregoing section, who, though free from distortions of content, retained some schizophrenic stamp in their movements or demeanour; in one case this was marked, though in the others somewhat elusive. In all it was apparent in the physical, rather than in the psychic aspect of the constitutional whole; it lay neither in what they said nor in what they seemed to think, but rather in their actual modes of self-expression.

Thus, a youth of 23 was post-operatively farouche in manner, slovenly and unshaven, careless in dress, wearing his cap (as though for protection) drawn exaggeratedly over his eyes; his nails were extensively bitten; his conversation was jerky, and he avoided the examiner's gaze. What he had to say was plain enough, nor could distortions of content be elicited. At home he got up at a reasonable time, helped his father assiduously at his work of trading in vegetables from a coster's cart, could be trusted to buy and sell, and to harness and look after the horse; he went to the cinema, would give an account of what he had seen, liked to take walks in the country, and was helpful in the house. At home, the things about him that were new were (1) a tendency to state some over-simple judgment in an over-emphatic way and thus to be self-assertive, (2) a marked addiction to bad language, mainly in the over-frequent use of the word 'bloody.' As a result of these traits, his mother said, 'He's either taken for being rude, or an ignoramus.' They certainly gave him a loutish quality, said not to have been previously apparent. It was of interest that from earliest childhood both the patient and his brother, whenever they ran slight temperatures, would have visual hallucinations of spiders and daddy-long-legs; but the patient, unlike the stable and better integrated brother, had always been solitary, unable to take his own part, sick when travelling, a failure at examinations though not in routine work, withdrawing from competition and social life, unable to make friends, retreating from feminine company, liable to tears even in adolescence, while the implication of immaturity lies in the mother's saying of his military career: 'He was too good a boy, too honest, too truthful, too innocent to be in uniform.' The personality, then, prior to his 3 year illness, was not hopeful, and although 'mentally clear' by 6 months after operation, his adjustment was unmistakably precarious.

approachable than she had ever been in the years before her illness.

The last of the 8 cases discharged on trial is that of a 31-year-old man, ill for between 2 and 3 years, during which he lived in circumstances fraught with menace, surrounded—as he thought—by German warders, and subjected—as he believed—to the rigorous discipline of a prison camp, from which he maintained contact with the outer world by voices which came to him on elusive wave lengths emanating from the secret service. He reacted to this setting by bouts of violence with attempts to escape. He said that he had fits of meningitis, and was now and again filled with coils of electricity the charging of which led to outbursts of destruction, with smashing down of doors. *Six months after operation* he was quiet, co-operative, and interested in his surroundings. *Twelve months after operation* he was home, and has remained there more than a year. He was not attentive to his appearance, except on special occasions; he had shown little initiative over getting work, his suitability for which is limited by post-operative epilepsy. The family was sufficiently well placed, however, for this not to be a necessity, and the patient led a satisfactory, if leisured, life, getting up at a reasonable time, helping about the house if in an eccentric way and obstinate when corrected, going to the films and footballs matches, paying visits to relatives, taking his own ticket and catching the train without guidance, meeting old friends, and studying the racing form. Though alert, active, and interested, he was only partially orientated in time, had insight neither into his illness nor into his recovery, and believed the mental hospital to have been a military barracks. Like many schizophrenic patients, he was unaware of having had an operation, or of any change within himself. He still received messages which distinctly told him that he was all right and was getting along well; he doubted that these were wireless messages, but had no views on, nor interest in, their origin. He appeared to have neither delusions nor ideas of reference, except in so far as he misconstrued his past, but he had some thought disorder in that he could easily be led in conversation to solemn but wildly illogical conclusions. He looked after himself and was very little nuisance to his family, except that he increased the burden of home laundering by allowing his clothes to get very dirty when gardening, etc. He fitted in harmoniously, and though not actually useful, he caused no social embarrassment and was affectionately accepted.

This ends our consideration of the 8 patients discharged on trial, of whom, though all were still psychotic, 7 were able to

sonality was better, so did a better post-operative personality emerge. His adjustment was at a higher level. He has, in fact, continued to improve and, when last seen 2 years after operation, although temporarily out of work (for complicated reasons by no means his own fault), he was no longer furtive nor given to strange breathing, he held his shoulders back, looked one in the eye, and talked on even terms. The only legacy of his former state lay in still bitten finger-nails.

The next 2 cases might be described as the analogues, among the female patients, of the last two.

One was a lady of 28 who had emerged from an illness which had lasted for 5 years in a frank form, with insidious beginnings before that. She was aloof, slightly furtive, avoiding direct gaze and looking downwards or sideways [illegible] glancing almost over her shoulder [illegible] cinated). She admitted to having b[illegible] did she believe, that she had had an operation. She said, when asked, that she could formerly make the birds talk to her in human speech. She could not now do this, nor did she know how she managed it before; she merely remembered that she had done so. She was not interested in the phenomenon, and from the point of view of interest and emotion in general, she was distinctly flat. She had little to say spontaneously, but answered questions quite readily and with intelligence. No distortions of content could be gleaned apart from memories of her psychosis, some of which she inclined to accept as having actually occurred in reality outside herself, as no doubt they seemed to do at the time. It was her furtiveness, her flatness, and an occasional sly smile, rather than her lack of insight, which gave the impression that the illness was not entirely in abeyance. Twelve months after operation she was home, where she managed quite well, but was inclined to act on impulse and without due consideration, was inert, tended not to finish tasks which she had started, showed little initiative, and gave her family the impression that she needed repeated stimuli from others to keep her going at an efficient level. She showed no psychotic content. In course of the following year, she had a disturbed episode when visiting in circumstances which made special demands upon her. She became more withdrawn, more inactive, taciturn, and brooding. She was seen occasionally to smile to herself and once to laugh. When asked at what, she said, 'Rumania.' She wandered away once or twice, and when asked why replied that she was forced to,

Twelve months after op[illegible]
his uncle taunting him [illegible]
rages, aggressive, threat[illegible]
moil. At interview, he [illegible]
was uncertain what course to follow for the best, could lose his hallucinations if interested enough in what lay before him, but was without insight, while the psychosis was also becoming more complex and overwhelming, though 2 years after operation he was still precariously at large and much the same.

The next case might have been thought even more discouraging. A youth of 20 had had 5 admissions to mental hospitals, without recovery between, since the age of 15½. He had undergone a marked change rather suddenly soon after he was 14, becoming secretive and taciturn though still very affectionate, showing an unaccustomed sensitiveness to criticism, an increase of worry and a self-consciousness with blushing. In hospital he was off-hand and detached, inattentive, preoccupied with vague ideas of royal connections, and doubts, therefore, as to his actual parentage. The affect was inappropriate. He was removed against advice, led an aloof hermit's life at home, rarely speaking or going out, brooding and unoccupied. He was sent to a school of arts and crafts (in which he was interested) to give him occupation, but he fell into a stupor and was again in hospital. He was again removed against advice, but now showed an irritable hostility, sometimes throwing things about, and refusing to communicate at all with anyone at home. He was sent to a third hospital where, electroplexy having only mitigated his state and modified insulin having made no difference, he was operated on after 14 months, having then been frankly ill for more than 4½ years. Six months after operation he was at home and working. There were some disquieting features similar to those of the last case. He seemed furtive, avoiding the examiner's eye; he hunched his shoulders, looking forwards and downwards in conversation; he took a series of curiously deep breaths from time to time for no apparent reason; his nails were extensively bitten; he had left his first job since going home because he could not tolerate the noise. Yet there were also favourable signs. He was ready to talk and quite chatty; he showed spontaneity and animation; his range of activities included a club and he had made several new acquaintances if not actual friends; he read a few books, kept in touch with current events, and was exceedingly accessible. Despite the earlier onset and greater length of illness in this case than in the foregoing one, just as the pre-morbid per-

which the outstanding features were anergia and lack of application. His failure to attend to the demands of reality, both in business and private life, gave him an appearance of gripless incompetence, seemingly devoid of any appropriate accompaniments of anxiety or worry. He never reached a state of stupor, though this seemed sometimes not far off. Between whiles, he would emerge into states where normality did not appear far off either, but which were characterized by vagueness and inconsequentiality which led to erratic conduct. After operation he showed immediate improvement. Within a few weeks he was fully orientated, not without insight into the past, free from psychotic content, far less asocial, and though lacking energy took exercise, attended dances, played billiards, kept himself in touch with current events, and showed responses that were in general appropriate. This, however, was within the framework of a ready-made schedule adhered to under supervision. Under rather more elastic conditions, working on a farm, irresponsible and unrestrained behaviour showed itself. He did not get up in the mornings, was capricious about what he chose to do, and became 'too lazy to scratch himself.' At the same time he was interfering, had scenes with the workmen, and threw a bucket of water over one who had rejected unsound and officious advice on the mixing of cement. Return to a more secluded environment did not effect improvement. A tendency to giggle began to appear, and the patient was only in a limited way able to subdue a prankishness and lack of restraint. Yet, this was not '*witzelsucht*' as ordinarily understood. There was no sustained facetiousness, no tendency to puns or silly verbal jokes, no continued euphoria The giggling was mainly in answer to rebukes, only occasionally spontaneous. The prankishness consisted in annoying other patients, following them around, tripping them up, suddenly flicking them in the back of the neck, and in being abusive with bad language. This was done without gross malice and with only the mildest aggression. Yet it was enough for the patient to be demoted gradually through the whole gamut of the hospital accommodation until a long residence in the disturbed ward resulted. This was placidly accepted But he was at any time capable of perfect reasonableness so that at interviews he would be fully alert, intelligently interested, able to converse freely with no apparent abnormality and with good sensorial powers, and fully in touch with his surroundings. He would either frankly deny silly behaviour, or would say that he had been misunderstood, but there was no interruption of such conversations by fatuous jocularity, and they were con-

but would explain no further. She showed a very marked improvement on returning from the visit to familiar surroundings; her behaviour was within normal limits and she showed no psychotic content in what she said. Apart therefore from this episode she had no frank relapse in 2 years since operation, but the adjustment was considered to be precarious enough for admission to an after-care home. It is to be noted that she was living in a sheltered fashion; her relatives said 'any responsibility would send her off again.' Though she had not had a full relapse, she had shown no further improvement.

The other, a diffident person of 26 who gave the impression of being a young girl, had had a hebephrenic type of illness for just over 4 years. Six months after operation she was tousled, with wrinkled stockings and a careless demeanour. In conversation she was distractible and very suggestible, so that she would easily agree with something much at variance with what she had previously said, seemingly unaware of inconsistency. She was vacant and woolly. When stimulated, however, by questions and suggestions, she became animated and responsive, although she would then lapse again into hebetude. Her former tendency to worry excessively had been exceedingly reduced, however, and she coped calmly with situations which would have agitated her before; further, she was fairly sociably inclined (though still with very few friends), and her family successfully stimulated her so that she had quite a wide range of activities. From these she found positive enjoyment. Although the pre-morbid personality was less good than that of the foregoing case, in this one the illness seemed to have receded further. She improved greatly with passage of time, and a year after operation had been working part time as a secretary, giving much satisfaction, and was anxious to secure whole-time work. One might have felt that she was less than her age, and a person of some *naïveté*, but one could not have thought her ill in any sense. In some conversation about mental hospitals in course of her work, she had one day shown herself to some extent familiar with their ways. It had been assumed at once by her colleagues that she had been nursing. She maintained her level and continued at work.

The other 3 cases still having some stamp of schizophrenia are of interest in showing the beneficial effect of home surroundings when these are satisfactory.

A man of 27 had had a fluctuating illness lasting for more than 3 years. The onset had been sudden with wild excitement, after

holding any other than a simple job or in the management of his personal affairs.

The sixth case, who still showed a schizophrenic stamp on discharge, is of interest in that, although it appeared so gross, it affected her life so little in contrast to what would have been expected.

A woman of 32, who looked 18, had had a very insidiously progressive illness with an onset at least 10 years before. She was an eccentric artist, who, always aloof and asocial with people of her own circle, had warm attachments to others of a lower cultural level. 'If I'd been of her class,' the housekeeper said to me, 'she wouldn't have liked me.' She belonged to the left wing, and formed friendships with tramps and artisans. She sold Communist papers in strongholds of Toryism. If she saw disreputable passers-by she would ask them in, and if they were asked to leave the house by others they said they had been hired as models to sit by the hour. They had, like the Fire Brigade, to be paid to go away. In consequence, the house became known to a variety of undesirables as a means of livelihood. The patient (with a bad family history in that 2 out of 5 sibs had had frank schizophrenic breakdowns, one of them steadily progressive) became steadily slower and more withdrawn. She developed auditory hallucinations and her thinking became bizarre. She painted for 18 hours a day, often without stopping for meals, silent, neglectful of herself and her surroundings, stooping, and with every appearance of extreme muscular rigidity. When seen before operation she was mute, but would sit in a room painting; the technique, both of applying the colour and of mixing it, was strange and suggested a schizophrenic all-inclusiveness of thought; the whole palette was covered with pigments which had been run into each other to form a surface that would have been uniform had they been just a little more mixed; the canvas similarly presented a surface in which every brush stroke was merged indeterminately with the next, with further merging of the colours, so that in misty outline some definition of shape could faintly be perceived. The results were without merit, and achieved with an indescribable slowness: the mere movement of the brush from palette to canvas was a matter of minutes rather than of seconds. There were no neurological signs and there was no muscular rigidity in fact. After operation the patient went to live with some of her artisan friends. These were very nice people, intelligent and of high standards, who took the greatest care to promote the patient's welfare. At first

ducted with appropriate affect in a seemly fashion. This state of affairs, also apparent to the nurses and doctors of the hospital, was difficult to interpret. A part of it no doubt was due to boredom, facilitated by post-operative lack of restraint. Certainly the patient often complained of being bored, and such antics were not at variance with his previous personality. Two years after operation, he was taken home some thousands of miles away. When seen there he had settled without difficulty into his own life. After a short holiday (the only noticeable abnormality during which was that though he spent much time lying on the beach, he steadily refrained from entering the sea and would give no explanation of this, though he had been an enthusiastic swimmer before his illness), he was given a job of negligible consequence in the family business. He attended this regularly and discharged it satisfactorily, so that his relatives were considering seriously a request from the patient's former employer to allow the patient to resume his quondam occupation of motor salesman. His income was supervised, but he was reasonable in his expenditure. Within the home, he was mildly but not unduly boisterous, devoted an almost excessive amount of time to the company of his nephews and nieces, talked a great deal in happy but simple vein, and was easy to get on with. Although he was thoughtful and considerate, it was noticeable that he had not the same depth of feeling, that he worried almost unduly little and consulted his own inclination instead of, as formerly, being a slave to duty. Outside the house, he had renewed many old acquaintances, was a regular snooker player and attendant at the cinema, enjoyed whatever diversions offered, and drank frequently but never excessively with friends. He was regarded as essentially within normal limits by a particularly devoted family, though on the outside observer he made an impression of great *naïveté*, bucolic and engaging good humour, with difficulty in self-effacement and an undue readiness to express over-simple judgments with the utmost confidence. As regards the last, however, it was noted that he eschewed women, which he had not done before; this was probably as a result of the onset of his illness being associated with a disappointment in love which had come upon him in especially cruel fashion. In any event, considering that the illness had persisted for more than 3 years despite all forms of treatment, that it carried a very poor prognosis, and that the post-operative convalescence had been exceedingly prolonged with little hope for the future, the net result was a surprisingly good one. Even so, little confidence is felt as to the patient being able satisfactorily to fend for himself, either in

to her reliability. First, she had unexpectedly called at the Labour Exchange to inquire about the work situation in general, and at the local hospital to inquire about nursing vacancies in particular, which showed some lack of insight. Second, since adolescence she had had many queerly conducted 'affairs,' and had been preoccupied with sex in hospital, and now said that she had renewed an old acquaintance in the neighbouring town; simultaneously, many references to men appeared in her conversation, and one night at 10 p.m. she had wanted to go out, saying, when asked why, 'I want a man.' *Twelve months after operation* she was in general much the same but her speed at familiar tasks had much increased. She was now being paid at the nursery garden, instead of paying, because she was definitely useful. She took quite a lot of trouble over her personal appearance, and bought clothes without being stimulated to do so. A certain meticulousness which had appeared for the first time, oddly enough, after operation had persisted. She was steadier and less erratic; showed no signs of changing her work, and her liking for men's company had led to no embarrassments at all. She was more accessible, but her greater spontaneity brought out a mannerism not previously seen; namely, a tendency to mutter a word or two inaudibly at the end of a sentence. She showed more initiative in [illegible] ntly, and she was [illegible] useful presents. [illegible] she had bought about the house, which she was then able suddenly to bring forth as a surprise. It was realized, as a result of the longer period of observation, that she was less intellectual than she had formerly been, and that most of her conversation dealt with gossip and chance affairs. She did, however, keep in touch with current events, and had read various books—some of a highbrow sort—of which she was able to give some account, and she had resumed the piano which she played quite well. *Two years after operation* the post-operative meticulousness still proved rather paralysing at her work. In 'pricking out' seedlings her output, despite much diligence, was only about one-third of the normal, and when told to dust some plants to keep down leaf mould, she applied the material to both upper and lower surfaces of each individual leaf She was described by her employer, however, as 'on the whole a big help to us, and we have been very glad to have her. . . .' She was still very slow in movement, apart from meticulousness, but less so than she had been. In speech she was quicker once she had started, but was still very slow to begin. Although she had still a 'praecox stance' and gait, this was less marked. She was

she had been inert and apathetic, content to lie for hours in bed in which she would be incontinent of urine. Steadily stimulated, she had improved. Six months after operation she was paying to work, as an apprentice and extremely slowly, in a nursery garden She attended diligently, worked in obsessive fashion, and was reluctant to leave at the end of the day. She rode a bicycle to and from the neighbouring town on recreational excursions, shopped intelligently and with initiative, attended films and plays, took her turn with the household work, and had executed some summer plans for the garden. In the family circle she was spontaneous, commented pointedly, was friendly and talkative. Indeed, she was more free of speech than she had been for many years and showed a not unpleasant pertness. Viewed thus, her life might be considered within normal limits. But she was almost inaccessible to strangers, she was as always negligent of her personal appearance (though very cleanly), and her slowness was extraordinary. At interview, contact was most difficult to establish, partly due to the patient's paralysing shyness, partly because of her very long reaction-time. She gave the initial impression that one was talking to a full-blown schizophrenic; yet her answers when they came were to the point. She was fully orientated, was aware that she had had an operation and agreed that she had been ill though doubtful to what extent No distortions of content could be elicited, and she showed none in her daily life. Though she said practically nothing spontaneously, she would describe her routine, economically and without readiness, would give an account of her leisure and of some shows which she had seen. Sensorially, she could retain 8 digits forwards and 7 backwards, she remembered a name, address, and a flower after 5 minutes, she did monetary calculations easily, she retold a simple story accurately and with understanding of the point. These more automatic responses were more rapid than those which involved self-expression. Her only complaint was that they did not let her paint; their reason was that when she did she became slower still, and seemed to be becoming again preoccupied and withdrawn. When asked, she showed some of her post-operative works, and these were the products of talent. It was noticeable, too, that on going upstairs to get them she ran, and showed normal rapidity of movement which contrasted strangely with her tortoise-like deliberateness over drinking tea or talking. This extreme slowness, in contrast to what she actually said, gave her an appearance of being somewhat lost, but that she was capable of taking the initiative was shown by two items which at that time were causing doubt as

improved, and 3 were in some respects worse. Of the 26 who left hospital, we have seen that 5 were removed against advice (of whom 1 showed slight conduct improvement while 4 were virtually unchanged, and only 1 of them still remains at large); that another might more safely have been retained in hospital; that 8 were well enough, though still showing distortions of content, to be discharged on trial (and 5 of them have been able to adjust quite well); that a further 7, though free from distortions of content, yet retained some schizophrenic stamp. This leaves us only 5 more cases to consider, and these were the cases that left hospital in full remission.

(*d*) *Patients who left hospital in full remission.* In the remaining 5 cases discharge from hospital was neither an experiment nor a concession to hope. It was demanded by the degree of recovery achieved.

It will at once be remarked that the number thus confidently discharged was only 5 out of 77 in the incontestably schizophrenic group. Let us see how they fared.

One of them had a frank relapse, while leading a sheltered and leisured life such as she had, in fact, led before, in the twelfth post-operative month. But this was not to an extent which compelled return to hospital, although such would probably have been the case had her circumstances been less easy.

Another showed deterioration of conduct over a period of 3 weeks which was followed by an epileptic fit. He was able, however, to work in an engineering firm, though ultimately he was asked to leave it.

The others have maintained the level of health which they had reached on discharge from hospital.

None of them (except the relapsed one, when the relapse had occurred) has shown any distortions of content.

Four out of the 5 had insight in the sense that they knew they had been ill, and that they had recovered following an intracranial operation. The exception was aware of the various procedures to which he had been subjected, but regarded them all as having been entirely unnecessary. To the extent that, in addition to deep insulin, heavy sedation, and electroplexy, he underwent eradication of focal sepsis including Horgan's operation, and in addition had an adrenalectomy, some sympathy may

able to paint without adverse effect, had enjoyed summer holidays, had taken up sewing, knitting, etc., and had quite a wide range of activities.

This case has a double interest. It shows the contribution that can be made by intelligent and individual attention to a seemingly hopeless patient, providing that such attention is paid by people for whom the patient feels regard and to whom she is willing to respond. And it appears to be an instance of the removal, by surgery and rehabilitation, of the psychotic components of schizophrenia while the motor phenomena still remain. Much the same might be said also of the seventh case, the last in this small sub-group of cases who have been discharged from hospital free from distortions of content, but yet not fully recovered.

A man of 28 had a frank catatonic illness of 5 years' duration, with an insidious onset for several years before that. He was at times automatically obedient with the minimum of response, and almost mute: at other times capricious, destructive, inaccessible. Post-operatively, he made a steady return into the world as we know it. Twenty-eight months after operation, and 2 years after return home, he was attending a secretarial course on four afternoons a week, and was an energetic participant in local musical activities as well as being a member of a choir competing at festivals. His life was otherwise leisured, to which his circumstances entitled him, and conducted without positive aims; it was also very sheltered and limited with almost entire absence of social contacts apart from musical meetings. It was doubtful how far he would be employable, but he was fully sensible, travelled on his own, went shopping, and was an excellent host. Traces of the psychosis remained in his doubtful and literal thinking, though these were by no means superficially obvious, and in his complaints that he sometimes felt blank and was slow. His slowness was variable, only sometimes outwardly apparent and then only in his *movements*, but he had a *persistent* and noticeable oddity of stance.

We have now reached the point in our considerations of these 77 schizophrenic patients at which we have seen that 3 died at operation, and 2 subsequently; that of the 74 survivors from operation, 48 remained in hospital, of whom 2 were very substantially improved and could have lived outside it, 5 were markedly improved, 23 showed enough improvement of conduct to ease considerably the nursing burden, 15 were virtually un-

absence, and the same is true of a third to a lesser extent, so that no regrets are felt on balance. The fourth patient was found to be an aloof and self-centred fellow, whereas he had previously been companionable, and the exercise of tact was required in dealing with his lack of consideration, while the fact that he was obstinate in pleasing himself instead of re-acquiring the habits of punctuality, diligence, and interest in the concerns of others, was considered an ill omen for successful adjustment in the world at large. The fifth patient was tolerated perfectly well until she relapsed, since when she has naturally been some source of anxiety.

As regards the efficiency of these 5 people, it may be said that 3 of them made themselves distinctly useful, the fourth worked but only in a fashion to please himself, and the fifth (having relapsed) was a passenger. In fact, 2 of the 5 patients worked full time in outside employment: one was an efficient housewife; one, who had had work difficulties before illness, fulfilled the family requirements by keeping house in the mornings for his blind mother and by working for his brother as an assistant at carpentry in the afternoons; and the fifth, always a lady of leisure, continued to be one. Such a statement, however, presents the facts rather too happily, and a word should be added about the whole-time workers. One of these had been working on a farm for 12 months as a paying pupil, in order to consolidate his improvement, but he treated the arrangement rather as one taking a cure at a thermal spa, than as a person determined to rehabilitate himself; having, as he felt, consolidated his improvement, he gained work in a well-known engineering firm with which he had been some years before, but he there maintained his post-operative record for tardiness and lack of punctilio although he succeeded in retaining his job over a period of 6 months. The other whole-time worker, who had previously worked in factories, failed at his first job of learning to stuff mattresses despite intensive instruction, but thereafter worked satisfactorily as an apprentice cutter in an upholstering firm at £5 a week. The efficiency of the 5 patients in full remission is, therefore, only moderately impressive.

Their social adaptation, also, is lacking in various respects. The tendency to outspokenness of 2 patients renders them dubious

be felt with his view: but he carried it to the extent of believing that he had never been unwell at all.

Two of the patients showed a noticeable inability to gauge the passage of time, but, apart from the usual difficulty of digit reversal, only one of the cases showed marked sensorial impairment.

She could be got into a confused state in which, with the appearance of Goldstein's 'catastrophic reaction,' she would make increasingly wild mistakes to the point of becoming almost incomprehensible. With a change in the conversation she could be restored to normal and could later produce the desired answers correctly and without confusion. It must be stressed that despite this tendency she was a perfectly competent housewife. The question is: Did this tendency represent a post-operative effect, or was it a residuum of the psychosis? In answering this, two items must be borne in mind. Firstly, such behaviour could be explained in accord with Goldstein's views, as resulting from frontal lobe damage. But, secondly, her conversation lacked direction and she easily became involved in matters quite abnormally remote from her initial theme of talk, into which tendency she showed small insight. That had not been the case before her illness. This might indicate a tendency to scattered thinking, determined by the psychosis rather than by operative damage, to which a mild post-operative lack of restraint had also contributed. There is no sure answer to the question, but it is probable that both factors were involved.

A fourth out of the 5 patients, without gross sensorial deficits, was indecisive, vague, and woolly, lacking in grip; but this was essentially in line with the pre-morbid state, which in those aspects has been altered neither by illness nor by operation.

The personality changes in these 5 patients (considered to have been in full remission) were those characteristic of the post-leucotomy state as previously described, and showed no special features. Their extent ranged from minimal (in 1 of them) to considerable (in 3 of them). They can best be indicated by the opinions of those who had to live with them. One patient was affectionately welcomed in the home and was considered to be without significant drawbacks; the presence of another was considered an advantage far outweighing the drawbacks of

Of the 7 patients who were discharged from hospital with freedom from distortions of content but who still retained some schizophrenic stamp, 2 underwent a partial relapse after a year. Of the other 5, one lived tolerably in sheltered conditions without working; one, who for long after operation had shown continued primitive behaviour, adjusted excellently and works in sheltered circumstances; one was steadily at work of a kind more humble than her potential talents warranted; another, working part time, became fully well and in some respects better adjusted than ever before; the last, despite genuine employment difficulties, has steadily improved and can be considered in full remission.

Thus, out of the whole group of 77 patients there are 3 who have been restored to something indistinguishable from their pre-morbid level; there are 2 who earn their own living in the open market, but who are less than what they were; 4 are gainfully employed (or the equivalent) in sheltered circumstances. Nine patients, therefore, make some social contribution in the world at large.

Then, there were 9 who still showed distortions of content, and whose discharge from hospital was inspired by hope rather than by confidence. One returned to hospital after 6 weeks, but in easier circumstances might have continued to lead a sheltered life; 3 were unemployable, and a burden in the home; 2 were acceptable in the home but chronic invalids in the sense of being unfit for work; one was useful in the home but with psychotic residua that constituted definite drawback; one worked erratically for his father, but would have been unemployable outside, and though post-operative changes had been added to his psychotic residua, was not an unacceptable personality; one kept house, and though still retaining old delusions showed small personality changes in the direction of being, if anything, more amiable than before.

If we add these to the foregoing cases, we have 3 who have been restored approximately to their pre-morbid normal, 2 who earn their own living though with residual handicaps, 4 who are gainfully employed in sheltered circumstances, 3 others who are of some use though not gainfully employed, and 3 who are acceptable home invalids. The other 5, including 3 relapsed cases, are crosses borne by the relatives with more or less patience.

social assets outside the home; a third lives almost entirely in retirement; another has made new contacts but has held their friendship more by virtue of their tactful understanding than by his own efforts; the fifth is reasonably well-adjusted in his woolly way. It is of interest that the 3 with religious inclinations have still maintained them, not to any pathological extent, though the mother of one remarked, 'Wild horses wouldn't drag him from the synagogue on Saturdays.' But on the whole, their social adaptation was also unimpressive.

On the other hand, such a degree of recovery is truly remarkable in view of the fact that 4 of the 5 seemed gravely deteriorated. One of them ate faeces. Another threw faeces about as a variation from spending 7 years on his knees in prayer, so that he had developed contractures of the semi-membranosus and semi-tendinosus muscles. All might have been given up for lost by virtue of their having been severely ill for between 3½ and 7 years. The absence of dementia in the once so-called 'dementia praecox' is illustrated by all these cases, and it is interesting that one man, on his first week-end at home after 7 years of inaccessibility, inquired: 'What happened to those grey flannel trousers I bought in 1939?' It is ironical to have to record that his post-operative gain in weight precluded any chance of his wearing them.

Conclusions

We may briefly recapitulate the findings by observing that of the 74 survivors suffering from frank schizophrenic illnesses, 2 subsequently died of causes which in one instance certainly, and in the other probably, were related to the operation. Of these 74, 5 left hospital in full remission. Of those 5, one was restored to his former level, or something extremely near it, in the sense that he was able to work much as before and was with minimal changes in personality. Three were restored to a level at which they were able to work, but showed personality and intellectual changes which rendered them, though still acceptable, more primitive people than they were before; one worked as a housewife, one as an artisan, the third filled in time with farm work before resuming engineering, as to the outcome of which no great confidence is felt. The remaining case relapsed after a year.

that cases seemingly primarily hebephrenic may have some paranoid features, and that predominantly paranoid cases may show occasional catatonic features, it has been decided on the balance of the evidence, that 28 cases are catatonic, 27 paranoid schizophrenic, and 22 hebephrenic. In classifying the hebephrenic group, Lewis's conception of it has been adhered to, but with the addition of 4 cases with onset after 25, in accordance with Bleuler's principle that this category is the 'great trough' into which those which will not fit the other groups are thrown irrespective of age. Out of the 6 recovered (and unrelapsed) cases, 1 was hebephrenic, 1 was a paranoid schizophrenic, and 4 were catatonic. Of the patients who lead useful lives, though not fully recovered, there are 1 hebephrenic, 1 paranoid schizophrenic, and 4 catatonics, apart from those in full remission. The total number of cases at home reflects much the same proportion: there are 5 hebephrenics, of whom 2 should be in hospital; there are 7 paranoid schizophrenics, 2 of whom have frankly relapsed while the third is a potential danger to the public; there are 10 catatonics, all of whom manage tolerably well.

The duration of illness was also significant. Of those who had been ill for more than 10 years (25 in number), none recovered. One was discharged and is useful; 1 left hospital but returned to another within 6 weeks, though she might have made some adjustment had conditions been easier; a third case is probably well enough to live at home under sheltered conditions. Of those who had been ill for between 5 and 10 years, 1 recovered, 1 recovered but relapsed, and a third was discharged. This was out of a total of 12 cases. There were 11 patients who had been ill between 4 and 5 years, and of these no fewer than 8 were discharged, though 1 of those is a burden and anxiety. Seven of the 8 live tolerably well in that 4 are recovered, 1 though not recovered is able to keep house and lead a normal life, and 2 of them are amiable passengers, welcomed in their homes. (There was a rather high proportion of catatonics in this group compared with the others.)

Of 20 patients ill for between 2 and 4 years, 4 were discharged, of whom 1 is recovered, and 1, never in full remission, relapsed. Two more cases were substantially improved.

Finally, of the 5 patients removed from hospital against advice, 3 were returned forthwith and a fourth later, while the other constitutes a serious burden in the home.

We may now consider the case-material of this group as a whole with a view to discerning any broad trends which may be helpful in drawing general conclusions.

The 74 patients who survived the operation contained 33 women and 41 men. There was no significant difference in recovery rate between the sexes.

There was no correlation between the degree of recovery and the age of onset, though of 2 patients becoming ill after the age of 40, one was well enough to be discharged and to look after her home, and the other showed some improvement in conduct.

There was some correlation between the previous personality and the degree of recovery achieved. Fourteen patients were considered to have had pre-morbid personalities approximately within normal limits: 24 patients were considered to have had unstable personalities, characterized by erratic and impulsive behaviour, determined by an emotional lability poorly controlled, with poor judgment directed only to securing short-term adaptations, and therefore with repeated failures to adjust: 39 patients were considered to have had schizoid personalities, characterized by introspection, over-sensitiveness, lack of drive, a tendency to retreat from competition, and an absence of warmth in social relationships. Although 12 of the patients with schizoid personalities became well enough to be discharged from hospital (excluding those patients who, having been discharged against advice, were either returned to hospital forthwith or were retained at home against reason and common sense), i.e. nearly one-third of the schizoid group, only 4 fully recovered and 1 of those relapsed, and only 6 in all lead a life that is useful. Of the 24 unstable patients none recovered and none was useful. Of the 15 patients with normal pre-morbid personalities, 3 recovered of whom none relapsed, 2 were very much improved, and 6 in all are useful.

There was some correlation also between the type of illness and the degree of recovery achieved. Although the categorization of these cases is in many instances a difficult exercise, owing to the facts that with passing of time the symptomatology changes,

been necessary to clinch the diagnosis, instead of mere inspection of the patient as in the others.

(2) Three patients died of cerebral haemorrhage occurring at operation.

(3) A fourth died 11 months after operation in association with the development of epilepsy not previously present: a fifth died 21 months after operation from obscure causes.

(4) Fifteen of the 74 patients who survived operation showed epilepsy after it, but 2 had been liable to this before. Only 2 cases had single fits. There was a significantly greater development of epilepsy in the male as compared with the female patients. No extraneous factors were found to account for this. There was also a significantly greater development of epilepsy among the schizophrenic patients than in the other groups.

(5) Three of the 74 surviving patients might have been considered worse after the operation than before. One, with history of a progressive and unremitting gross schizophrenic deterioration in a younger brother, himself deteriorated after some months of post-operative improvement; another, improved in conduct, has deteriorated in other respects; a third can no longer be kept from urinary incontinence by vigilant attentions, but is otherwise substantially unchanged.

(6) Fifteen patients were unimproved.

(7) Thirty patients showed substantial improvement of conduct, 5 of them to an extent quite remarkable in view of the severity of their illnesses and the violence of their behaviour, and a further 2 to an extent where it is considered that they could live at home in a sheltered environment, if such circumstances were available.

(8) Twenty-six cases left hospital at one time or another, but 3 were returned forthwith, a fourth after 6 weeks, and a fifth after a few months. Two who remained at large would on all logical grounds have been better not at home. Thus, 19 cases were able to remain at home in a reasonable condition to do so.

(9) Of these 19, 3 patients relapsed after a year but have not returned to hospital.

Of 8 patients ill for less than 2 years, 3 were discharged, of whom 1 was recovered, and 1 was substantially improved.

The trend of these figures is to suggest that a somewhat critical point is reached at about 5 years, after which recovery is markedly less likely.

There are two other factors which appear to be of importance: a definite onset, and the occurrence, at some time or another, of stupors. This is not to say quite the same thing necessarily as that the patient belongs to the catatonic form, for some of the cases in this series which came to show predominantly catatonic symptomatology began with an insidious onset, whilst others who never showed catatonic phenomena began with a sudden disturbance of some sort, in the sense that it was possible to say that the illness began in a particular season, without prodromata, or in such and such a month, and in a few instances even on a particular day.

Using the term 'definite onset,' then, to mean that we can say, 'The condition started at such and such a time, and was not present before that, but it has continued ever since,' as opposed to being reduced to saying, 'This has been coming on in an indefinite way for a long time, with evidences of it here and there, but it is really impossible to say when it actually began,' we have 15 cases which combine a definite onset with the development of states of stupor. Of these 15, 5 cases had been ill for longer than our critical period of 5 years, but despite that, 8 cases were well enough to be discharged, 6 of whom were recovered and the seventh of whom lives tolerably, while the eighth was the patient who went to another hospital after 6 weeks' trial, but who, it is felt, might have adjusted well in better circumstances. Further, 3 showed very marked improvement, 2 were improved in conduct, 1 improved until he developed post-operative epilepsy from which he finally died: only 1, ill for more than 10 years, was unchanged.

Summary

(1) Seventy-seven patients are considered to have been incontestably schizophrenic. Only 1 of the patients was comparatively preserved so that recourse to the case histories might have

SCHIZOPHRENIC CASES WITH AFFECTIVE COLOURING

We come now to another group of patients, no better preserved than the foregoing and no less disturbed. These are just as unmistakably psychotic persons, but we cannot say that the actual nature of the psychosis could be so certainly diagnosed with the same ease as in our first group. This is not so much because the patients are less schizophrenic as because there is added to the illness something else; namely, a marked affective colouring. At one time or another, therefore, even after the psychosis became established, it might have been possible to have considered some of the cases to be the subjects of severe affective disorders rather than of schizophrenia, according as to whether the latter happened at such time to be somewhat obscured by prominent manic or depressive features. But when, not content with mere scrutiny of the patient, the examiner—even the inexperienced one—came to read the history or to discuss the case with some relative, medical officer, or nurse with knowledge of it, he would have recognized the co-existence of schizophrenia without hesitation.

To the extent, then, that there is some affective admixture to the schizophrenic condition, these are mixed psychoses.

There were 35 cases in this group, and 9 of them, on their being first admitted to hospital many years ago, were originally considered cases of affective disorder, though in each such diagnosis was later inevitably revised; in the others the manic or depressive colouring was either present at the onset but less obtrusive, or developed in phasic fashion as the years went by. In any event such phases, though irregular and variable, were sustained not merely over days, but over weeks, months, and even years. They were accompanied also by gross distortions of content, bizarre behaviour, thought disorder, and between times by affective incongruity.

Nineteen cases showed depressive phases only; 3 showed only manic phases; 13 showed both manic and depressive phases. One of these last (Case 218, page 247) was peculiar in that,

(10) Thus, 16 cases have maintained their improvement at home.

(11) These 16 have been observed post-operatively for between 2 and 3 years, and have been at home for between 1 and 2½ years.

(12) Of these 16, 8 are still frankly psychotic, though the delusions of 1 of them are confined essentially to the past. Only 2 of those 8 are useful in the home in a dependable way, but 5 of them are affectionately accepted by the relatives on the whole.

(13) Of those 16, 2 more still have some schizophrenic stamp though apparently free from distortions of content.

(14) Thus, out of the 73 patients still alive, 6 are considered to have recovered. Two of these 6 completed their recoveries in course of a steady improvement at home, and the other 4 appeared to have recovered before leaving hospital.

(15) Of these 6 recovered patients, 3 were restored approximately to their pre-morbid normal. The other 3 have marked personality changes so that, while by no means unacceptable at home, they are more primitive people than before.

(16) The best results were found in the catatonic, paranoid, and hebephrenic groups in that order, but more important than such categorization was a history combining an onset of the illness definitely localizable in time with the development at one time or another of stupors. Five of the 6 recovered patients showed this combination, while the sixth had shown states of stupor though with insidious onset of hebephrenic type.

(17) There appeared to be a time factor militating against recovery which became critical at about the fifth year of illness.

(18) The previous personality appeared of importance in the attainment both of recovery and of improvement. Those with approximately normal pre-morbid personalities did best, those with schizoid personalities did intermediately, and those with unstable personalities did badly.

content even in their mania. In these two cases the excitement shown was not episodic but sustained; the clinical picture had a marked element of manic disorder, and two of the cases were originally so diagnosed in fact. It has been considered proper, therefore, to include them in this category of schizophrenic cases with affective colouring.

As regards the extent of psychotic disturbance, there is little to choose, as has been said, between this group and the foregoing cases of schizophrenia without affective admixture. Twenty-seven of the 35 patients were in the most disturbed wards of their several hospitals. Nine of the 35 were able to sustain a conversation, but 7 of those showed multiple delusions and hallucinations with severely disturbed behaviour. Only 2 of the 35 seemed free from gross distortions of content; 1 was recurrently disturbed without reaching normality between, but would be amenable and co-operative for a few weeks, though still fatuous and irresponsible, between bouts of aggressive and hostile destructiveness: the other with a stormy 5-year history was affectively flat, devoid of insight into what had been happening to her, omitted important points in her history through a complete inability to see their significance, and treated the situation with a nonchalance born of her failure of grasp and detachment from reality.

For example (CASE 203, page 249), an excited little scold, tense, harassed, and indignant, between vivid descriptions which made it apparent that she had experienced catatonic stupors, explained how a neighbour had filed a key to fit her back door through which he had entered and stunned her while asleep, and how various doctors and friends organized a communication system by which she received from them spoken comments and exhortatory advice.

CASE 218, page 245. A wild woman, impulsive and violent for 6 years, and for 2 of them in a padded cell except when taken out for exercise, would only roar with laughter while addressing me amicably as 'Doctor Bloody Brown,' and was especially moved to mirth by the Superintendent whom she rallied, tweaking his trouser leg, by asking, 'Well, you gloomy old bugger, what's up with you?'

CASE 206, page 30. A girl of 23, with marked fluctuations in rapport, would answer questions between becoming quite with-

the noisiest patient in my experience, the tremendous push of talk was not paralleled by other motor activity, nor accompanied by much aggressiveness or unmanageability. She had for years shouted thunderously with ample lungs; she stopped only at night, under sedation, and would otherwise continue whether she were alone or not. She could be interrupted by questions, which had to be bellowed out in an attempt to shout her down; she would listen for a second or two to get the gist, and would embark fortissimo on the answer, with many irrelevant additions. These replies could have been overheard at a distance of 200 yards. She said that she was a mystery woman who had been on earth before, that she saw visions in the sky, that she was awaiting death, her lungs were in the pelvis, she was poisoned by the food and by the atmosphere, that she was dead (a noisy corpse), crucified and with rotting bones, her head filled with concrete but yet in receipt of mysterious communications which told her she was not a woman but a man who was run by an electric machine inside her. To talk to her was an exhausting and deafening experience. There was much depressive content, together with bizarre hypochondriacal and mystical religious ideas; some 14 years ago, the depressive content had been essentially to the fore with absence, or only occasional appearance, of this now sustained volubility with noisiness.

The thirty-third of the 35 cases had also shown years of over-activity, continually talking: striding up and down the ward interfering with other patients, with visitors and nurses; interrupting the doctors' rounds and writing by the ream voluminous letters to all sorts of people, threatening litigation, entreating help, or encouraging the recipients to propagation of her views on the social system. In these last she revealed both a thought disorder and deeply entrenched paranoid delusions which caused her to mistake identities, to misconstrue intentions and to distort the significance of events. She showed no discernible depressive features, nor was there actual elation accompanying her over-activity. The same is true of two other cases, the thirty-fourth and thirty-fifth. To that extent it might be objected that there was in these two cases no true affective colouring, but merely the addition of excitement to the illness. But not all indisputably manic cases are elated; many express a predominantly depressive

The first of these 3 cases, a woman aged 30, had mitral stenosis with auricular fibrillation. She had had rheumatic fever in adolescence. The illness began with a definite onset associated with depression, and developed into a full-blown catatonic state with excitement (so that at one time she was considered to be manic), followed by stupor. She varied between being mute, resistive, and inaccessible, appearing notably depressed for weeks at a time, and being transiently excited, impulsive, and violent. There were brief phases in which she would talk coherently, but she was otherwise given to irrelevant replies, bizarre remarks often with a sexual-sadistic tinge, and to neologisms and word-salads. Treatment by insulin was contra-indicated on account of her cardio-vascular condition, and electroplexy was also considered unsafe. Leucotomy was undertaken largely on this account. In the opinion of those looking after her she returned to within entirely normal limits and was discharged home. Her cardiac condition then deteriorated, and she died of heart failure. This was before she was due to be followed up in the sixth post-operative month, and in consequence I never saw her after the operation. Her local doctor, after discussion with the family, wrote: 'There is no doubt at all that after her leucotomy she did return to normal. She was quiet, not odd, very sensible, and most alert. She was not vague, woolly in her thinking, or preoccupied. She was slightly lethargic and indolent, very even-tempered and agreeable, not irritable or difficult. She certainly had no obvious delusions or hallucinations. There is, to my mind, no shadow of doubt that the leucotomy did her a great deal of good and so far as my opinion helps, had she not had this heart disability which ended her life, I should say she was a cured case, but of course the time was short and one can only judge by what she was before she had it done.' On the strength of these combined observations, she is here listed among the recovered patients although she is the only case to have survived the operation without being seen after it.

The patient who died in the sixth post-operative month was the only one in this group who was rendered worse.

She had been admitted to hospital just over 7 years before at the age of 44. Some months before admission an affair in which she had been engaged for some 10–15 years with a man other than her husband had become known with resultant social awkwardness. There is some doubt, however, as to how far the 'affair'—apart from the social consequences—may not have been delusional. At

drawn and detached. 'I think,' she said, 'I am a bit mentally unbalanced, I don't think I'm stable. It's through being inferior, I'm inferior. . . . I have been here, I beg your pardon, I must have been here almost exactly 8 months. No, I've been here, I'm sorry, 3 years.' (Correct.) She went on to say, 'I get very low spirited, it was someone I had been in contact with, when you come in contact with humanity, you know . . .' and then she entered a semi-stuporose state, as though the difficulty in self-expression were too much for her. To subsequent questions she mostly remained mute, but when asked if these upset her, she replied quite composedly, 'No.' She resisted physical examination and walked out of the room, but a few minutes later she came in again without speaking, and stood on her head against the wall. When told she did this very well she repeated it several times in different parts of the room, and it was remarkable how neatly and adroitly she managed in the confined space. She then smiled vacantly and silently offered to shake hands. When wished 'Good-bye' she replied 'Good-bye' in a hushed whisper, but made no effort to go, and had to be removed. She had for some time been liable to stand on her head almost all day, not in a sustained posture, but again and again; once, when a nurse tried to dissuade her from doing so in a puddle in the garden, the patient emerged from mutism to say, 'Nurse, you are over-conscientious in your duties.' It was thought that she had learned this trick from another patient who had been an acrobat, but no explanation of the habit was ever found except that she said, pre-operatively under amytal and post-operatively when she was again a fluent talker, that she had felt compelled to do it though she did not know why. Of her mute phases and of her frequent bouts of wild impulsiveness, she also said under amytal, 'They are as much of a mystery to me as they are to you.'

These examples give some indication of the case-material. Six out of the 35 patients had been ill for less than 2 years, 12 for between 2 and 5 years, and 17 for more than 5 years. The duration of illness is much the same as in the foregoing group of schizophrenics without affective admixture.

We come now to the results.

Deaths

All these patients survived the operation, but 3 of them died, in the fifth, sixth, & thirteenth post-operative months respectively.

we have here, cake, knife and fork teas nearly every day....' She said that often she was 'naughty, it's when I obey those unseen voices, oh, I can't tell you what they say, I'd be in your black books straightaway. They are most improper. Oh, yes, I hear them a lot, I rely on them entirely, oh, for my general deportment and demeanour, I'm one of those artists, you see.... I like to lie awake to listen to them, they make music and lovely sounds and give me good advice.' She said the voices made her think that she was very important to someone whom she named, and the proof that she was so was that he wrote her an official letter once a year. She then said suddenly, 'You mustn't say "Alleluia" before midnight of Good Friday,' and when asked why, replied, 'Because it prevents the Heavenly Spirit from entering the body.' When told that she had been overheard saying it in passing through the ward, she said very coyly, 'Aha, aha, doctor, but that was out of pique.' She was very ready to be excited and with encouragement could have become quite out of hand; her thinking was scattered and inconsequential, so that while describing passivity feelings and how her thoughts were read she would suddenly roll up her sleeves to show the scars of her dermatitis artefacta, saying, 'Now my spots don't pour forth blood, are they there for ever, am I marked for all time?' Although quite charming, she seemed, allowing for her mild elation, affectively shallow and deteriorated considering who once she was. As she took her leave she embraced me, mentioning that we could easily fall in love, pirouetted and curtseyed saying, as she waved her hand, '*Au revoir, auf wiedersehen.*'

The next visit to this engaging and potentially valuable, if psychotic, patient was a shock. The ward was empty except for one old woman immobile in a chair. She was dishevelled and sat quite still in a fixed attitude without play of facial expression. I asked with much surprise if this were the patient, and was told that she was. She was unrecognizable. She was helped to her feet on which she was not very steady. On shaking hands she showed a ghost of her old arch smile as she said that 'of course she remembered me.' When doubt as to the truth of this was (politely) expressed, she replied banteringly that she betted she did. On the threshold of the examination room she suddenly became agitated, drew back, trembled, and then yelled at the top of her voice that she didn't want to come in. She entered and sat down, however, without much persuasion. But now that her shouting had begun, it continued. Asked how she was, she yelled, 'I'M NOT WELL.' Asked in what way she did not feel well, she bawled, 'BECAUSE I'M NOT

the same time, she became very much concerned and exasperated over delay in the publication of a book which she had prepared, and the actions of some civil servants which caused a change in her professional circumstances were construed as an intended slight upon her. She became petulant, unco-operative, and difficult. This was followed, 6 weeks before admission, with the rather sudden development of overt depression with difficulty in sleeping. She decided she was pregnant by the man with whom she thought herself entangled, and was unable to accept the reassurance of an obstetrician. She became remorseful, felt that she was wicked, and would be put in prison, believed herself to be financially ruined. She thought she had venereal disease which was infecting others. She had visual hallucinations of black but unspecified animals, olfactory hallucinations of nauseating smells, and auditory hallucinations accusing her of vice. She developed the notion that things were not the size that she saw them (though there seems to have been no actual evidence of micropsia or megopsia) and formed extraordinary theories to account for it. In hospital, though humble and self-depreciatory, she showed impulsive tendencies, at one time trying suddenly to burn her shoes, at other times unexpectedly attacking others to whom she was talking. After 8 months she was taken home, improved but not recovered. She then began to receive hallucinatory commands, was in another hospital for nearly a year, and was but slightly improved. She continued thus being admitted and re-admitted over the years, but at home was increasingly obstinate and contrary, with curious habits which were unexplained, such as refusing to use the table silver, and walking upstairs in special and ritualistic fashion. In some of her admissions she was excited, using obscene language and exposing herself, with continuous talk In others she would be dull, quiet, uncommunicative, preoccupied by 'hundreds of voices talking to her in groups' and arranging her future life; she would refuse food, would be incontinent of urine and faeces, and extensively scarred herself with a dermatitis artefacta. Then she would take food away from the table in her pockets, would hoard rubbish, and throw the crockery about. At the pre-operative interview she was in a much better phase. She was a sprightly, lively, laughing little woman, who, though always puzzled-looking, did everything at a trot. Always an intellectual and able person (she had a half-column obituary in *The Times*) she was now very mannered. She said, 'I am normally extraordinarily superfluous Well, I think I am better, I ought to be, I've had enough good food, certainly extraordinarily delightful food

rigidity despite her rigidly immobile appearance, and the tendon jerks were brisk and equal on the two sides.

The medical officer said that the patient was quiet and amenable after the operation, though incontinent of urine. She moved very little and her spontaneity was reduced, but she would go to occupational therapy classes and worked well while she was there. She would answer questions and would talk reasonably when stimulated to do so, would laugh and show some animation. Just over a fortnight after the operation her husband (a patient in the same hospital with a pre-senile dementia) had died. The patient had been told of this but did not seem to be much moved. From about the third post-operative month onwards there was a steady deterioration, with shouting, refusal to occupy herself, further reduction of spontaneity, refusal to occupy herself, and increasing negativism, with resistiveness. The Ward Sister gave much the same account: 'For a couple of months she was very good. Then she got worse. She changes very quickly. One moment she's all right, and the next she starts bawling at you. It's not to any particular person, though. I've a feeling she's hallucinated though, because if she's in a room by herself she'll start bawling and shouting and swearing away. She cries a lot as she is now, but she doesn't drop any tears, she just makes a mournful noise. She has to be fed, she's got more resistive in every way, she doesn't like to be disturbed. But she's not resistive when you dress her; oh, no, she wouldn't get up on her own. And she's resistive over other things. She's wet and dirty. No, I don't think she has any frequency; she's all right as long as she's taken regularly to the toilet. Otherwise she just sits and does nothing. We used to send her over to the (occupational therapy) class, and she was very good, but then she started getting like this and we couldn't send her. We tried to get her to do embroidery in the ward then, she used to do beautiful work, but she just threw it at us. Her husband died, you know, but it didn't seem to upset her particularly. She was told about it, but she doesn't seem to realize it; she often calls for him, but she also calls that she wants her mother and her daddy too. She's often impulsive, she'll take up the china and just let it fly across the floor. No, that's not in response to anything, she'll just do it suddenly. No, she doesn't throw it at anyone, she doesn't attack. But she gets them down the way she shouts, it must really be awful to live with; of course, I've got quite used to it, but I think it must upset the other patients, don't you? They treat her quite well, take it as part of the illness. No, she doesn't make any conversation at all.' The patient was in fact correct in saying that she had a

WELL.' Asked why she shouted she said, 'BECAUSE I'M NOT WELL.' She stuck to this type of answer, but this was not mere perseveration because she varied its form though saying nothing more explanatory. Some questions she ignored, and she said nothing at all unless asked. The change from her static and immobile silence to these sudden and trumpet-like answers was most dramatic. Although she shouted so loudly that it was piercing to the ear-drums, she showed otherwise great economy of effort, seeming to use only her lips, tongue, and laryngeal muscles, with no other apparent movement and without accompanying gestures. By speaking to her persuasively and very softly it was possible to get her momentarily to moderate her tone, but this did not last. The conversation was thus difficult to sustain, and an attempt was made to begin again on the more neutral topics of appetite, weight, sleep, etc. Asked if her appetite was good, she bellowed, 'NO, IT'S VERY BAD.' Asked, in view of her previous spontaneous remarks, if the food was good, she shouted, 'NO, IT'S FILTHY.' She said quietly, when asked, that she had not gained any weight, but with regard to sleep roared out that she could not. She would not answer any questions about her alimentation; previously she had said, 'Oh, my bowels function with the most extraordinarily perfect regularity.' When asked if she had any trouble in controlling her micturition she shouted, 'NO.' This was incorrect, as she was incontinent; when asked before the operation she had said, 'Oh, that is all right except when I laugh extraordinarily and convulsively, and then it may play me a trick.' She would answer no questions about her orientation, though there was no doubt that she was orientated for place and person, knew her way about the hospital and the identity of those around her. She denied hallucinations or having ever been hallucinated, and when told that she had formerly described these to me she replied with a simple fortissimo contradiction. When asked if she shouted because she was angry with me, she shouted back, 'NO, IT'S BECAUSE I'M NOT WELL.' When asked again *she still said* 'NO,' but when asked a third time, she said, perhaps pardonably enough, 'YES, I'M VERY ANGRY WITH YOU.' She would answer no questions designed to elicit paranoid trends, and asked what she thought about, bellowed, 'NOTHING,' while asked what she did all day, she screamed, 'EVERYTHING AND NOTHING.' Asked about her mood, she said pathetically, 'I'M VERY UNHAPPY BECAUSE I'M NOT WELL.'

Physical examination, over which she was only partially co-operative, showed no abnormal signs; there was no muscular

improvement over a month or two, only to relapse, though not to deteriorate as did this patient. (4) That despite the operation, the patient had a swing towards depression. In favour of this are the facts that she looked depressed, said that she was unhappy, showed reduction of interest and activity, and loss of appetite with early waking. That swings from depression to mania can occur as a result of operation we know already, and this would seem an instance of the converse occurrence. Her noisiness, throwing of crockery, and resistiveness may merely have represented the more primitive and less restrained reaction of her more primitive post-operative personality to a return of that depression to which previously she had also reacted with resistiveness, impulsiveness, and double incontinence, though then without noise. The influence of the large amounts of sedation on the clinical picture must also be considered but this does not seem to have been gross.

On the whole, it would seem likely that several of these factors have combined to produce this deteriorated state. It is probable that the incisions, or the damage resulting from them, did extend too far posteriorly, that (though there seemed to be no confusion) there was some cortical irritability secondary to organic damage, that some not understood immediate beneficial operative effect (other than mere section of the fibres) later ceased to exercise its influence, and that in addition to these, the patient re-entered a depressive phase as well.

The third death in this group occurred in Case 218 (see page 237), a 50-year-old woman who had been tempestuously psychotic, bawdy, lewd, violent, impulsive, and destructive for 14 years after a sudden, stormy onset in which there was much excitement against a severely depressive background. Pre-operatively she appeared quite deteriorated and disintegrated. Post-operatively she remained much the same in those respects, but was thoroughly manageable and became a ward pet with a reserved seat (in which she always adopted a crouching attitude) next the fire. About 10 months after operation she began to get steadily feebler for no apparent cause; she took to her bed and her vitality seemed to be getting used up; she died in the thirteenth post-operative month through no apparent cause except progressive feebleness. The surgeon had noted in this case too that

poor appetite, that she had not gained weight, and that she slept badly: she could get off to sleep, but woke early and was noisy in the early mornings. Two weeks after this interview the patient developed bronchial pneumonia, from which she rapidly died. The autopsy confirmed the pulmonary condition as the cause of death. By one of those exasperating interventions of Providence which so often spoil important cases, the brain did not go to the pathologist for whom it was intended, and at autopsy it was merely inspected without special study. It was reported that the incisions appeared to have been made in the correct plane and showed nothing which would incriminate the operation as a cause of death. Notwithstanding this, since the operation seemed to have played a part in rendering the patient unrestrainedly noisy, which she had never been before, since this led to her receiving large amounts of sedation which no doubt accelerated the progress of the terminal disease, and since she showed a progressive, if unexplained, physical deterioration, she has been included among those cases of death indirectly due to operation.

The progress of events in this case is difficult to explain. There would seem to be four possibilities. (1) That the incision, or spread of damage due to the incision, was too posterior so that the patient followed that progressively downward course which we have previously noted to occur after posterior cuts. In favour of this view are her appearance of being greatly aged, her immobility and inertia, the lack of play in her facial expression, and her failure to show physical improvement. Against it is the fact that the surgeon noted merely that the ventricle was entered on the down stroke on the right side at operation, whereas we have other cases in whom the ventricles were entered on both sides on both up and down strokes with much less deleterious effect than this. Further, the patient appeared reasonably well for as long as 2 months after the operation before the deterioration began. (2) That some damage occurred subsequent to operation, or that the effects of tissue damaged at operation began to make themselves felt only at this later time. There seem no theoretical grounds for supposing this. (3) That there may be some immediate beneficial effect of the operation other than section of the fibres which ceased to be maintained after some weeks. The only point in support of such a view is that a considerable number of other cases have shown a temporary marked

and tormenting himself, riling the other patients by a constant deep bass rumbling of unintelligible complaints as he strode up and down grimacing, always adopting threatening attitudes, snatching food, grubbing on the floor to swallow bits of dust and fluff, and often impulsive in behaviour. Post-operatively he was much less excited, his banging, emphatic shouting and gesticulating were much reduced; he ceased to be threatening; he no longer annoyed other patients; he was not impulsive; he was cleaner and less slovenly; he could be employed at simple tasks like sweeping mats. He would occasionally interrupt streams of seeming gibberish into which he interpreted deep rumbling noises, to answer simple questions, which he did in an almost normal and natural tone. The noisiest woman of all (CASE 218, page 235), who had declared herself both a mystery woman and a man with an electrical machine inside her, was markedly quieter though with outbursts; she would sometimes be sociable with other patients, which she had never been before, and between talking quite disconnectedly of her sexual changes she was able to discuss, in limited fashion, news which she had read in the paper. This improvement was increased over a year, so that she spoke quite quietly, though fast when she had got going, and had only occasional outbursts. She spent all her time up and dressed, whereas before she had been for years in a side room. She wrote letters, and read a certain amount, so that it was worth while for her to have glasses. Over the second year after operation she remained much the same, and though her content remained unchanged or almost so, she was able to attend to things outside herself, was no longer an intolerable nuisance through noise, and was a far more harmonious member of her little circle. The other patients who were significantly improved had changed to much the same extent. The degree of improvement is admittedly a modest one, and a person seeing these cases for the first time after operation might raise his eyebrows at the notion that here were therapeutic successes. But there was significant improvement none the less; and 5 of the 9 cases had been ill for 20, 19, 16, 14, and 13 years respectively.

the downstroke on the right side had passed through the ventricle, that there had been some right-sided bleeding with post-operative bulging of the incision on both sides.

Epilepsy

One patient, a woman, had 2 fits, on the ninth and on the tenth post-operative days. She had no recurrence, without medication, in 29 months. A second patient, who had had fits before, continued to have them with much the same frequency. A third patient, also a woman, was said to have had a single fit many years before, but had none post-operatively.

Unimproved cases

Four patients were virtually unimproved in that they remained grossly psychotic; one was even less in touch with reality, but markedly happier in the sense that she said she was well, appeared quietly to enjoy herself, and had ceased to fret or to indulge in aimless worry; another had taken to occupying herself a little with sewing and had gradually ceased to attack others, though with no substantial alteration in gross distortions of content; one was no longer violent, whereas she was often so before, was less distressed, less often doubly incontinent, but was perhaps increasingly bizarre in her remarks and in behaviour; one, still grossly paranoid, had less initiative in attacking and was less noisy, but her turbulence seemed gradually to be returning and she had aged considerably in the 2 years since operation, while taking less care of herself and showing an increasing looseness of her thinking and behaviour.

Cases with improved conduct

Nine patients showed a significant degree of improvement, some in themselves, others in easing nursing difficulties. One of these was the lewd and bawdy woman who had spent nearly all of 14 years in padded cells, and who later became a ward pet before she died in the thirteenth post-operative month. A man, grossly psychotic for 19 years, had for a decade talked continually and incoherently, apparently wearing himself out

fully well enough to live at home, as contrasted with only 24·7% among the schizophrenics without affective colouring. It is to point this contrast that the cases have been classified in this way.

Unlike the schizophrenics without affective colouring, all these patients recognized that they had been ill, though they varied in their concepts of, and abilities to explain, the illness. All knew that they had had operations on their heads, and that such was a therapeutic procedure from which they had derived benefit, though one attributed her recovery to will-power. To that extent their insight was more complete.

Cases retaining distortions of content

Only 2 patients retained delusional ideas.

CASE 203, page 237. A woman of 48 with a 5-year illness, who has previously been described as an excited little scold, tense, harassed, and indignant, and who had had a catatonic illness with phases of elation and depression, was keeping house 6 months after operation, though not given full responsibility. She still retained her beliefs that she had been stunned while asleep by a neighbour, and that other neighbours had overheard conversations and been enabled to know her thoughts through the installation of a dictaphone in the parlour. But to this she seemed no longer to attach the least importance; she had never spoken to the neighbour about it, she had not bothered to look for the dictaphone, and she assumed that it had been removed during her residence in hospital. A measure of how far the importance of this had receded was that her husband was astonished when the delusion was elicited in his presence; he had assumed it was in her mind no longer, for she spoke of it to no one. She still heard voices of the doctors encouraging her, though these had become less frequent and more stereotyped, saying merely in reassuring tones that she was better. In the home, she was no longer the rigid, high-principled idealist, touchy, fussy, and restrictive. 'She was always very stubborn, and she was very nervy. If anyone was coming to the house, like a doctor to see me, she'd be up very early in the morning, not a speck of dirt anywhere. She'd never let us sit down for a moment in our working-clothes, she was always too house-proud. She was always on the go, she wouldn't sit down and have a read though she might just scan the paper; she'd never leave home, never go out unless I really made her. She was very serious. She's different altogether now, she'd go out every night

Markedly improved cases

There was a more marked degree of improvement than this in 5 cases, in whom it was not only the conduct but also the thinking which had changed much for the better. All these cases might have been able to live at home in sheltered circumstances, though one of them towards the end of the second post-operative year developed a mildly excited state with push of talk, wishfully coloured confabulations, and a restless over-activity which was much what he had shown in the early pre-operative phases of his illness though then with far more conviction, aggressiveness, and intensity. In the other 4 cases improvement was sustained. From them no distortions of content could be elicited, and the psychic abnormalities consisted only of an impairment of time sense (though they were orientated for important dates), a vagueness which militated against decision, a lack of shrewdness and of being 'on the spot' which would have effectually dissuaded one from entrusting to them without supervision any task that was not a part of everyday routine. It was difficult to know how much this state was a result of the operation, a residuum of the illness, or the product of long confinement in a limited and unstimulating environment. They were on a slightly higher level than the comparable cases of the purely schizophrenic group described on pp. 200–4, in that their mentation was more clear, but their behaviour, partly through reasons of upbringing and partly through inferior previous personalities, was not quite as good; it was marred by lack of punctilio, a sulkiness in adversity, and occasional aggressive ripostes when things were not to their liking.

Cases discharged from hospital

Then, including the case already described who died of heart failure in the fifth post-operative month, there were 16 cases who were discharged. All of these were fit for discharge within 12 months of operation save one, who was removed by importunate relatives against advice, was returned to hospital, but who did finally become fit and who was discharged rather more than 2 years after operation.

Thus, 16 out of 35 cases or nearly 46% of this group became

She got up earlier than before, but it was uncertain whether she really rose, as she claimed, at 8 a.m. She no longer snatched food, she didn't eat too much. Her spontaneity had returned, and so had her activity: 'She's much more particular about the house, practically back to her old standard.' She did all her own work, and did it well, except for the laundry. She was not fussy enough about details; she still used too much coal and took margarine and butter to what was excess in view of the rationing; she did not bother to use up the scraps when cooking, in which art, seemingly through lack of interest, she had lost proficiency, and she did not plan the food well, while, to save herself trouble, she would sometimes cook the vegetables for two days at one session. She did not bother to read owing to previous difficulty in getting suitable glasses, but she had never been a reader before; she would listen to the news, but was inattentive and disinterested in anything other than domestic affairs. Her delusions, never voiced, remained unchanged but the hallucinations apparently had stopped entirely as though, her improvement consolidated, she no longer had need of their reassurance. After 2 years she had no new delusions, no ideas of reference or strange thoughts, and she seemed to ignore entirely such psychotic remnants as remained.

The other patient who retained delusional ideas did so to a lesser extent, and yet was less fully recovered. She had been a less positive personality, more shrinking and schizoid, reared in a limited and repressive atmosphere which had rendered self-expression difficult. At 28 she had developed an attack of 'influenza,' after which she became listless and apathetic with poor appetite. This developed into frank depression with continued worrying over bizarre hypochondriacal complaints, which became associated with innumerable items in her environment so that she was constantly the subject of unpleasant ideas of reference which led to paranoid developments. Electroplexy made her worse, and the content became increasingly disintegrated and bizarre, so that her sister (formerly the subject of a similar illness) was locked in the attic by Germans and communications in Morse were repeatedly tapped out on the fender in answer to hallucinations. Outbursts of excitement followed and the patient entered into a stormy illness in which she was wildly impulsive, violent, and suicidal, stripping herself and destroying her clothes, between periods of mute resistiveness during which tube feeding was repeatedly required. She was operated on after a year and rapidly emerged into comparative normality. When she had returned home she led a normal, if secluded, life; she rose punctually,

if I did. She's laughing all day long,[1] she's very easy to get on with now, more so than she was. She's not so careful about the house, she does a lot of sitting down, and once she sits down I've got a job to get her to move again, and I tell you what she does like now, she likes a glass of beer or stout and she comes out for it now. She wouldn't go out with me before, but now she asks to on a Saturday night; she wouldn't like anyone to see her going to the pub before, but now she doesn't bother who sees her. And she used to go to Church practically every Sunday: she never thinks of it now. She doesn't bother. She didn't want to go to see the doctor, couldn't be bothered. I wanted her to because she's out on trial and they've got to sign a paper to say she's doing all right. "Oh, there's plenty of time," she'd say, not bothering. And there's another thing: she's doing very well, but she *won't* get up in the morning, it's half-past nine or ten, sometimes eleven. She doesn't mind about that; and once she refused to do the washing up, she laughed a lot about it. She's very extravagant, it gets me at my wits' end sometimes. She piles things on the fire, and she heaps the butter on the bread, you can't stop her. She eats all day long: the child may have some chips and she [patient] will come in and say, "Let me have one," and she snatches it, and she snatches any little thing off our plates, but it doesn't happen often.'

In these remarks there is an excellent picture of the post-operative state, with its indolence, its postponement of distasteful chores, its reduction of finicky fuss, its absence of self-consciousness and self-criticism leading to lowered standards with a preference for pleasure and immediate gratifications, but with scant regard for the consequences.

The reduced activity and restraint were shown also in what she said. 'She doesn't talk now unless you talk to her; if I don't talk she's quiet. Yes, she's very outspoken if anything rouses her, specially to the children, grumbling at them; if the little one isn't in by nine she'll be at her as soon as she comes in.' But that she was not entirely unrestrained was shown by her avoidance of bad language and by, 'She knows when to stop having a drink, she has one and no more.' And a hint of further improvement to come lay in the remark, 'I've seen a difference in her since she's been home over the past 5 weeks, she has settled to things more, she wouldn't refuse to do the washing up now, and she's looking forward about our silver wedding in June.'

By the end of a year she was improved, though still imperfect.

[1] The patient was not, however, euphoric.

or indicative of illness. After discharge from hospital, she obtained work on a part time basis in sheltered circumstances, and she showed gradual improvement in the development of increased spontaneity and speed of action. But more than a year after operation there still remained a noteworthy slowness, an apathy, and a failure to show a satisfactory degree of emotional responsiveness either to frustration or to pleasure, together with an apparent inability to grasp the importance of things that were vital to her future, e.g. she had taken only some of the necessary steps for securing the visa necessary for her to join her family who had already gone to live abroad. These might have been effects due solely to operation, but they were much more marked than in the great majority of cases, and they smacked more of a fundamental schizophrenic indifference.

A patient with a similar illness, less highly coloured, with sudden onset at 32, associated with depression, made a recovery which appeared to be complete while she was in hospital. She had always been a dull and backward, disgruntled, moody grumbler, retreating from competition and keeping to herself. On return home these same characteristics were exaggerated, with addition of the facts that she talked to herself a great deal (but then she was very deaf), and tended to make the same remarks over and over again. She was most difficult to live with on account of shrewish bad temper. The relatives were not intelligent informants, and although they said that she sometimes said things which were 'crazy' and which not infrequently led them to suppose that she was insane, it was impossible to obtain a single example of any such remark. She had worked hard over long hours and continuously at the same job for 2 years since her discharge; she had supported herself and her son; she had secured accommodation with the help of other members of the family and the local council, had fixed up her new house and had run it more rather than less satisfactorily, as well as looking after her aged mother who had come to live with her. She thus functioned as efficiently as she ever had, but she was unspontaneous, apathetic, automatic in her responses, and—even allowing for her deafness—gave a distinct impression of living within a carapace.

A more remarkable recovery was that of a woman of 33, who had been continuously in hospital for 15 years. The illness had an insidious onset with depressive colouring which gave way to a state of mild excitement, and was at first diagnosed as manic-depressive psychosis; she achieved something near recovery after showing mood swings for 18 months, but was noted as childish, facile, careless, and apathetic. She then had a further manic attack, becoming

helped with the housework, did the shopping, rode her bicycle, went for walks, attended her chapel with its numerous social activities, and played the harmonium. She allowed herself more licence than before in her expenditure and in the way of answering back to a fond but dominating mother; she was not quite so thoughtful and considerate, was much more relaxed and less intense. Six months after operation she still believed that some elm trees visible from her window in the hospital had been cut by some art of topiary so that the branches spelt the word OIL, which had for her a mystical and religious significance. But she later lost this idea, and recognized it to have been her fancy. There was no other overtly psychotic content, but she lacked warmth, and in conversation showed qualities of automaticity and detachment. She got work, however was only partly satisfactory in it, and like many other patients she showed a tendency to frequent change, so had several jobs during the next 2 years, until she returned home to look after her mother in an illness. Soon after this, though the change did not appear to be causal, a relapse began. This started with vague ideas of reference, later crystallized into certainties and accompanied by depression of mood which was diffuse, and seemingly not the product so much as the determinant of the referential ideas. The illness appeared to be starting again in much the same form as before, though with a partial insight derived, perhaps, from the previous experience. She did not seek re-admission to hospital, but stayed at home.

Cases with no distortions of content but without full recovery

Then there were 4 patients who, retaining no distortions of content that could be elicited by examination, yet had still some stamp of the illness left behind.

One of these patients had been ill for 7½ years. The onset at 23 had been sudden, associated with marked depression, and this had developed into a violent catatonic disturbance, with excitement and destructiveness, periodic but irregular development of stupors with muteness and resistiveness, and the frequent appearance of sustained depressive phases with weeping. Deep insulin wrought no change, but there was marked though short-lived response to electroplexy, which could never be maintained. Post-operatively she became calm, amenable, pleasant, co-operative, but she was markedly unspontaneous and slow, and sometimes did not answer when spoken to. She showed no abnormality of behaviour other than this, and never made any remarks that were considered odd

Catholic because my mother was a Roman Catholic, though father is Church of England; but the cook is a Roman Catholic, but of course she's cooking, there's not much time for religion or talking about it because she has to get on with her work, but you must tell me if I'm anaemic, for the cook says I'm anaemic and says I have dark circles under my eyes. . . .' It was difficult to tell how much these curiosities of conversation were due to post-operative effects (lack of restraint leading to inconsequential remarks through loose association of ideas), how much to schizophrenic residua, and how much to the fact that she had for years been living in an unstimulating and sheltered environment where nothing in the way of precise self-expression was demanded.

One of the most remarkable (CASE 229) and even more instructive as to the possibilities of delayed improvement was that of a woman of 41, with schizoid pre-morbid personality, who had had a rather suddenly developing illness with manic features in a setting of minor frustration at the age of 31. Over-possessive but fond parents had kept her at home for a year, despite protests from the neighbours, before her original admission to hospital. During this time she had been impulsive, violent at times, and unpredictable, smashing things and throwing them out of the window, dashing out into the street unclad, and making incoherent conversation of which no sense could be made. After 12 months the parents were worn out. The patient, restless, talking incoherently, shouting and roaring with laughter, posturing grotesquely, was admitted to hospital saying: 'I am calm, and that means British justice. There is not enough breathing space here. I want an eraser. I do not know who the lecturer is in this place.' She threw anything within reach on the floor, and used much professional jargon (she had been a trained nurse in a mental hospital) in inappropriate contexts. After 9 years in hospital it was said that she had not spoken a word of coherent sense since she had been admitted, that she was wildly destructive whenever she had opportunity, constantly violent to patients and staff alike, resistive to all attention, degraded in habits, and a nursing problem of the gravest kind. She spent almost all her time in a side room and habitually required generous sedation. At interview she was almost inaccessible; at first she would take no notice of remarks addressed to her, but lay dishevel[illegible] mattress on the floor. Later she would make quite [illegible] remarks to questions, suggesting that we should [illegible] repeating a list of names, mentioning several wards in the [illegible] [illegible]nd then, becoming increasingly excited, she spoke f[illegible]

excited and erotic, after which her state varied greatly over many years. At her best she was vague, dreamy, apathetic, sarcastic, making plans (quite unrelated to reality) for getting married, untidy, mannered, and indolent. At other times she would be impulsively violent, showing affective incongruity, with stupors and deteriorated behaviour such as spitting her food out, continually twisting and pulling out her hair, and owing to bouts of excited violence requiring frequent seclusion in padded rooms. Thirty-four cardiazol fits and numerous applications of electrical treatment made no difference, and she slipped into a condition of mutism with resistiveness punctuated by occasional unexpected orgies of destruction. She was repeatedly noted to behave as though she had hallucinations, but it was not possible to establish details of these. She showed a very slow gradual improvement after operation, dressing herself, keeping herself clean, occasionally speaking, [illegible] letters to [illegible] onsisted [illegible] months after operation she would say nothing spontaneously, would reply to questions by nodding or shaking her head if possible, and otherwise would answer in almost monosyllabic whispers though she would occasionally produce whole sentences. Seven months after operation she started to talk much more freely and to extend her interests. She was discharged within a year, and when seen at home she was living a quiet life of leisure, was attending a course of cooking classes, looking after herself and her own room entirely, doing her own shopping, going to the cinema, to theatres and concerts, knitting, and writing letters which did not show evidence of perseveration. She had satisfactorily taken charge of the house during the housekeeper's two weeks' holiday. She was, however, very slow and apathetic; most of her activities were undertaken as the result of being stimulated; she showed little interest in things outside the home and no inclination to make social contacts apart from arranging for some acquaintances from the hospital to come and visit her; in this last, she was effective in action, used the telephone, and showed herself fully capable of the limited amount of organization required. Examination of the mental state showed no abnormality beyond her restriction of interest, and a tendency to thought disorder in the form of an undue inclusiveness of irrelevant material, so that she would relate such topics as Roman Catholicism and anaemia in the same sentence, and a literalness in talk which showed an unusual sense of values. For example, 'Of course, I'm a Roman

few days she was very well. She asked for her wrist watch, and wore it; she busied herself about the house and was helpful; she looked after herself and read the paper. She spoke very little and went to bed very early as she had done in hospital. Then she became increasingly irresponsible; she turned on the electric stove for no reason, played with the light switches, began to talk more, regretted she was too old to have children, and made sexual and strictly taboo remarks not unmixed with bad language. She would put coal on the fire when it wasn't wanted, ate grossly, and took to getting up in the middle of the night and laying the dinner although the next meal was to be breakfast. She would give no satisfactory explanation of these things. During a Sunday morning motor drive she became excited, apparently through seeing her former place of worship, and when the family sat down to lunch the patient seized the whole joint, was very abusive when exception was taken to this, and struck her father a shrewd blow on the head with a ladle. She was re-admitted to hospital forthwith. She was then negativistic, grimacing, gesticulating, smiling furtively, and occasionally saying, 'Lie, lie,' 'Mind, mind,' and 'Get away,' apparently in response to auditory hallucinations, and she showed a few impulsive outbursts. But soon after admission her behaviour had settled down so that she required no special supervision, was no trouble, sat about reading books, but would not help with ward work. When seen 1 year after operation, still in hospital, she was fatuous and empty. She answered nearly all questions by saying that she didn't know or that she couldn't say. She could not or would not explain her return to hospital, but agreed that she 'was supposed to have had' some trouble over one Sunday lunch. She was orientated in all spheres, and no positive distortions of content were found except perhaps when she said that she was not a Christadelphian; on admission she had attributed her trouble to her religion, but at no time would she enlarge on this. She was giggly and off-hand, refusing to sit down, shifting from one foot to the other, darting arch glances, and refusing to take part in sensorial tests. She appeared a burned out schizophrenic, for whom nothing further could be hoped. But 2 years after operation, still in the same hospital, she was markedly different. She was still strange in appearance, hunched in posture, slow and stiff in movement (though without neurological signs), with wiry schizophrenic hair and disinterested in her personal appearance (though much tidier). She had been promoted to a better ward. She was vastly more spontaneous, remembered and greeted me with a shy but pleasant manner, said that she was

faster and louder and louder in entirely incomprehensible fashion without grammatical construction of sentences. She knew her way about the hospital, and recognized those who looked after her, was aware of where she was and whence she had come, recognized her family when they came to see her, but was in every respect as unco-operative as she could be, throwing and smearing faeces and making spiteful and vicious attacks. After operation she became amenable, would dress and look after herself and would follow the hospital routine without trouble. Six months after operation she was still very odd, looked in the opposite direction when addressed, was ill at ease, paced round in circular fashion like a dog about to sit down, smiled in a secretive but coy way, but would answer most questions though ignoring some. She agreed after a bit to sit down, which she did as far away as possible on the extreme edge of a chair, and seemed to be ready for flight from some expected erotic advance. She was thereafter more conversational, and some of her replies were designed to put the examiner in his place sharply. She said that she felt more tired than she used to, and that she was more untidy, that she felt bad-tempered and was in general getting worse rather than better. She seemed to have neither delusions nor hallucinations (though she now admitted to having previously heard accusatory voices), but she contradicted herself often. She made one or two spontaneous remarks, one of them to the effect that she did not know why, but she found that she kept on saying, 'January, February,' to herself. She discussed in a very limited way the possibilities of going home to which prospect she felt some ambivalence. She was 53 weeks out in the date, and tenaciously stuck to her answer, and showed in other respects marked impairment of time sense. She was unco-operative over sensorial tests, and her efforts to head the examination away from them resulted in some more spontaneous conversation. She interjected odd remarks at intervals with a mischievous smile: e.g. in course of conversation about her family, she suddenly said, 'I like my heavenly Father,' *and at the end of the interview she refused to shake hands and when* asked why, replied, 'Because I used to be a Christadelphian.' Q. 'Don't the Christadelphians shake hands?' 'I don't know, I dare say some of 'em do.' In general, she showed a vast improvement, being clean in habits, never violent, requiring neither sedation nor seclusion, willing to do routine tasks under supervision and taking some pleasure, when pushed, in knitting. Within a year she had been taken home by her parents, who had never had proper understanding of the extent of her illness, against advice. For the first

committee day but one. She has been, according to her mother, perfectly normal. That can hardly be an unprejudiced observation; but it is noteworthy that accompanying the mother's written account, there was a neatly written note of quite appropriate sort from the patient herself, said to have been written unaided though at her mother's suggestion. It is now felt quite possible that this patient may continue to improve far further and to return as far within normal limits as may be allowed by her previous schizoid personality, her 12-year experience of mental hospitals, and her cerebral operation.[1]

Recovered cases

The remaining 10 patients all showed complete recovery from their illnesses; one of them, however, who died of heart failure in the fifth post-operative month before she was followed up and whose case has already been described (page 239), was not personally seen as has been previously explained. Another of them relapsed, in a setting of difficulty caused by the failure of her husband (who had deserted her) to help morally or financially, and by his actually encouraging the children, on a rare visit, to insubordination; they were already too great a responsibility for her post-leucotomy personality, and the home conditions were in other respects unsatisfactory.

She became increasingly worried, restless, and inefficient, which further added to her concern; she took to aimless walking to satisfy her restlessness, and then auditory hallucinations developed of a critical and depreciatory kind. She wandered from home, was admitted to an observation ward, and thence to another mental hospital. Seen within a week of admission, however, she had so far settled down in these more sheltered conditions as to show no abnormality, to have insight into what had happened, to have participated in arrangements for the children's welfare, and to be considered quite normal by the nursing staff who observed her all day. Owing to the difficulty of arranging satisfactory conditions outside she remained in the hospital for a further year, before being again discharged. She had by then gained enormously in confidence; had decided on her line of action concerning the husband; got work in domestic service; and proved quite able to

[1] She has since been on a seaside holiday, and has been regularly employed for several months.

very much better. She realized why she was being visited, asked if I had seen her parents, said she understood that her father had lately written to me, and she had thought a further visit from me was approximately due. She then explained that her father had died suddenly since writing the letter, that her mother was much upset, a [illegible]
s [illegible]
t [illegible]
held over to the next committee day but one, the date of which she had ascertained. She showed only rather slight distress over her father's death, but a reasonable concern for her mother's welfare. She expressed disappointment over the upset in her own arrangements but recognized it to be inevitable and was patient and resigned. She was economical of speech and ill at ease, but her conversation was logical, coherent, and to the point. She was fully orientated in all spheres, equable in mood, and was evidently free from hallucinations, delusions, and ideas of reference. She was reluctant to discuss her illness for the most part, was inclined to take refuge in a possibly genuine amnesia, and to meet difficulties by replying that she didn't know. But in these respects her remarks carried much more conviction than before. She recognized that she had been ill, understood that she had had an operation on her head on that account, and was inclined to attribute her improvement to it. She could repeat 7 digits forwards, 4 backwards; she did simple addition of money correctly, but got only 2 out of 4 sums right in subtraction. She understood and could retell the cowboy story, reasonably interpreted the proverb about glasshouses and stones, but was literal in explaining 'Too many cooks spoil the broth,' and 'All that glitters is not gold.' She was an excellent and dependable ward worker and her behaviour in hospital was regarded as quite normal. It could not be said that this was a normal person; she was too hesitant, too odd in appearance, and insufficiently mistress of herself to be that. But the absence of gross abnormality was very striking, considering what she had been like 2 years, and even 1 year, before. The picture must not be overdrawn; the patient was naïve, simple, to some extent even childlike; she was not a person on whom one felt one could rely for the execution of anything the least essential. But she was unrecognizably different from the wild, violent, and animal-like being that had been interviewed in a padded cell before operation, and from the capricious, empty, fatuous, and quaint personality that had emerged post-operatively. She did return home after the next

feelings of unreality with depersonalization followed by frank depression with a suicidal attempt. She was admitted to hospital, where she stated that she wished to die. After 4 applications of electroplexy she became impulsively violent, restless, and aggressive, still expressing suicidal ideas and very difficult to manage. She was removed to another hospital, where she said that there was disgrace [illegible]

feelings, and varied between co-operativeness and aggression in a somewhat unpredictable way. She received 50 comas with deep insulin, though for various reasons most of these were of only 10 minutes' duration. She showed no improvement, demanded constant attention, was restless and aggressive, tried to suffocate herself, swallowed buttons, etc., and was removed to a third hospital, where she was found to be experiencing accusatory hallucinations, with thought blocking and thought disorder. She would become withdrawn and inaccessible, and then would suddenly emerge from a period of mute resistiveness by leaping out of bed or trying to destroy the electric light fittings, or making unexpected dashes at the windows. She became incontinent of urine and faeces, negativistic and difficult to control, suddenly striking people and showing hostility, against a background of miserable depression. She made repeated attempts to injure herself. When seen, allegedly on one of her better days, she resisted entering the room, was unwilling to lie down, would not co-operate in examination. She looked harassed, frightened, but determined. She darted sharp glances about, as though either looking for means of escape or for the source of imaginary voices. She said that she wanted to die, also that she wanted to go home. She moved her eyes as though hallucinated, and said that she heard the voice of her husband coming from the other side of a door, and saying that he was coming for her. She wept stormily, beat her fists upon the bed, then curled up and shut her eyes to lie still in resistive silence. She appeared very suspicious and extremely tense. She required to be kept under constant observation. She improved from the moment of operation, losing her tension, becoming happy, co-operative, interested, and contented. Within a month she had ground parole, had gained in weight, looked and felt in every way better, but, as her environment became less simple and restricted, it became more apparent that she was facile, lacking in initiative, and that she was not industrious unless spurred on. On discharge 73 days after operation she was

look after herself. Unfortunately, persuaded by her mother that she was exploited by her employers, she left the job. Two others suited her less well and she was sacked from a third for inefficiency. This brought out the dependence and despondency of her pre-morbid personality. She has remained erratic and unreliable though apparently free from actual residua of the psychosis.

More successful was another patient, who had been severely disturbed for more than 2 years; her family is agreed, in quite a calm and dispassionate way, that 'she is better than she has ever been,' more equable, more tolerant, less shrinking and sensitive, on better terms with life, and without undesirable change in personality; the patient in fact has mild deficits, but her environment is not such as to bring them out. A fourth patient is in much the same case; the moodiness and tempers that marked her adolescence and early adulthood have gone; her tiresomeness and awkwardness, her sense of frustration and dissatisfaction have disappeared; she is a slightly more primitive person that she was before, unambitious, easily satisfied, appreciative of simple pleasures, and lacking in the discrimination and eagerness that she had shown before. But though her potentialities are less, so are her liabilities, and she is an easier person to live with. Further, though she was formerly unable to cope with life in the A.T.S., she has (post-operatively) joined another service, and is, after a year in it, well adjusted to conditions comparable with those which formerly contributed to her breakdown. Four more patients, with rather more stable previous personalities, have returned approximately to their former level, showing minimal personality changes. Two more of these recovered cases show undesirable sequelae. One of them, always an unintelligent woman of low cultural standards, is more sluttish than before, less dependable in the way she keeps the house and in her attentions to the children's welfare, less spontaneous and with the edge taken off her activity and interest; her previous faults are exaggerated, but only slightly. The last case, however, is somewhat different. CASE 213.

A woman of 44 had a history of rather more than 2 years' illness with definite onset characterized by worry over headache and backache, feelings of self-depreciation, a notion that she was not fulfilling her duties, and insomnia. After nearly a year there were

she was so hard-hearted and outspoken.' 'She's always been kind-hearted and allowed herself to be sat on. She's always given way for the sake of peace. Now she'll stick her teeth in.' Towards her husband, who inspired great affection, and her son, she was if anything more affectionate on the whole, but now she withheld sympathy. 'If I say that I've got a pain, before she'd have run about and got things, now she says, "My back's bad, I've got a pain too."' She allowed nothing to worry her, except occasionally when criticized she might say earnestly that she hoped she'd never have to go back to hospital, and might shed a few tears for a moment in the privacy of the bedroom. Otherwise, she never worried at all, least of all about money (of which there was plenty). 'She's not got much idea of values these days, she'll go to the tradesmen and order a lot of things she doesn't want, oh, they're the sort of things we might want, she thinks we want them, but we don't, and her bills get big. She'll go out and spend 5 shillings or 5 pounds, it's all the same, it's got to go. She couldn't go into town with the money in her pocket and not spend it. If she gets anything she can't keep it. For instance, if I go out in the morning and leave her a packet of cigarettes, she'd have smoked 8 or 9 of them by 10 o'clock, she just puts them in her mouth one after another; as [illegible] ewhere, and clear off [illegible] that, not serious, but things she wouldn't do before.' This lack of worry coupled with lack of restraint had led to difficulties in the housekeeping; there was one weekly bill of £8, and all were excessive for 3 people; this might have been partly due to organic damage leading to lack of planning, but it was apparent also in very simple things. 'She'll be wasteful of the rations, use them all up in a couple of days instead of a week, and then I have to take them out for meals.' And more simple than that: 'She's not so careful in her housekeeping habits, she keeps the place very well, but before, when her butter ration came she'd never have dreamed of putting it on the table unless in a glass dish; now, she'll put it on the table in paper, "Oh, I couldn't find the dish," things like that don't trouble her.' 'She'll buy a box of dates and have one, and leave it, and then she'll buy another one next day. "Oh, we may as well have another."' This extravagance was apparent also in larger matters; she had conceived a dislike of their new house at the beginning of her illness and as a symptom of it. Now she said she liked it, but she was still intrigued by the idea of change, and seriously took up the idea of buying another for no good reason except to assuage her restlessness. Similarly, 'She wanted

recorded as having bilateral extensor plantar responses, but these were flexor when examined by me at 6 months. She was free both then, and on all subsequent occasions, from any distortions of content. At home, various changes became apparent. 'As far as I'm concerned,' said the husband, 'to all intents and purposes she's back to normal. I've noted no troubles with her at all since she's been home. She's quite over the illness, she runs the house entirely.' But it soon became evident that this was in reference only to the psychosis, for in other respects than her content of mind there were marked abnormalities. She was extremely restless. She awakened soon before 6 a.m. and was too restless to stay in bed. This was part of a general impatience: 'If she wants to do anything, she has to do it at once, she can't wait, and she gets very irritable if she's kept waiting.' When she had got up there was 'no rest for anyone; yes, inconsiderate is the word, and she'll play the piano at half-past 7; no, she doesn't do it for long, about 10 minutes and it's enough, she doesn't stick at anything for long.' She would cook the breakfast, even on Saturdays and Sundays, at hours such as 7.30, would call up the stairs, and when the family arrived down to eat it at the ordinary time, would say, 'Well, it's here, why didn't you come down before?' She would busy herself about the house, working all day, though she would switch from one thing to another quickly, often without finishing the first thing before she went on to the next. She showed fatiguability and would take frequent rests during which she would do nothing. 'She can't read now, she's tired of a book in 30 seconds.' By about 6.30 p.m. she would be tired and irritable, and would go to bed at any time between 7.30 and 9 p.m. The same restlessness obtained if they went away; 'If lunch was served at 12 she'd be in the dining-room at a quarter to, and as soon as she'd ordered she'd expect them to bring it at once, and if she was in she wanted to go out, and if she was out she wanted to be in again.' She wrote great numbers of letters; these were unnecessary, but were neatly written, showed no excitement in their content, were coherent and as much to the point as an unnecessary letter could be. Some of the letters were to members of the family, and these were in highly critical vein, for she had considerably changed in her attitude towards people. She had quarrelled, not entirely without reason, with her mother on return home from hospital; she had always been sensitive over maternal domination, but had formerly submitted and 'would do anything for her.' 'Now, she was at her the whole time and it got so bad I said, "You'll have to go away" It was completely foreign to her to be like that,

into her shortcomings. The picture, as it is read, is very suggestive of hypomania, specially considering the early waking, the talkativeness, and the fact that there had been such marked depressive features in the illness. (There was a family history of temperamental instability, but not of manic or depressive illness). The patient herself, however, did not give that impression. She was very carefully made up and dressed, with elaborate coiffure. She spoke quietly and unhurriedly, without push of talk. She seemed markedly cheerful and good humoured, but not elated, though she giggled occasionally in a rather arch fashion at points in the conversation where a giggle was, if somewhat fatuous, not inappropriate. She was not over-active or fidgety during some 45 minutes' conversation, and she sat still. She was quietly efficient over telephoning to her doctor and arranging an appointment for him to be seen. She was garrulous, one thing leading easily to another, but she returned to her theme spontaneously, and was not inconsequential. She was in touch with current events in a superficial way. She was fully orientated, had no obvious loss of time sense, and was free from distortions of content. She could retain 7 digits forwards and 5 backwards, could retell a simple story and see the point, and interpreted proverbs reasonably. She calculated money correctly. She gave the impression of being a distinctly trivial and capricious person, somewhat fatuous, but she also gave the impression that if a situation arose that was important to her, she would be capable of being effective in action. If this were hypomania even in reduced form and limited as to its spread of excitation by a reduction in frontal lobe fibres, it was a hypomania that could be controlled. Her doctor did not consider her hypomanic, but self-centred and excitable. Further, there were some things at which she could be persistent; she helped her son quite steadily with his homework; she kept the house scrupulously as regards dust and cleanliness even though she tended to skip too readily from one chore to another; she completed some articles of clothing which she wanted to make for herself; and she took sedulous trouble over her own cleanliness and personal appearance. When seen 12 months after operation the picture had not [illegible] changed. She was still over-active [illegible]ractible; she talked too much and, [illegible]ough restraint; she was still careless and heedless, losing things, and buying things unnecessarily for the fun of it. Her husband had inevitably become more critical as the sense of the 'miraculous,' originally imparted by the 'cure' from what looked a rather hopeless illness, evaporated under the heat of such

a sewing machine and I got her an electric one a few weeks ago, but she's never looked at it.' 'She wanted a new coat, 'had her eye on one for nearly £600, but if she'd had it she'd have put it on the bed to keep herself warm. She did get an expensive one and she burned a couple of holes in it the first day, but she wasn't a bit concerned.' Her heedlessness extended so that 'she's not grateful or appreciative, she takes things for granted, I'm her husband and I'm to provide her with what she wants. We were talking about money one day, and she said herself, about the illness, "It cost you a lot, didn't it?" "About fifteen hundred pounds," I said. She said, "If it wasn't for my will power, I'd never have come home." She made out she'd done it, she wasn't a bit concerned about the money, and when I said so she said, "Well, what did you want to keep me there for?" ' She also took more than her share of rationed foods, but, though she finished her sweet ration the first day, she did not expect the others to share theirs. Nevertheless, she had become 'not so soft natured as she was, more calculating.'

She showed no self-criticism, and the lack of this, together with lack of associated self-consciousness, caused her an immense if misplaced increase in self-confidence. 'Before, she was always frightened, inferiority complex to some extent, if we went to a dance it would always be, "How do I look? Do I look as well as Mrs. So-and-so?" But there's no lack of confidence now.' And this caused her to stand up for herself unduly, as against her dominating mother and those relatives to whom she felt she had been too submissive for too long. So that when she was criticized about the housekeeping which was her province, she reacted in two ways. 'If I were to stop at home and see about these things, she'd kick up a row. If I say, "You must watch your sugar," she'll say, "I know what I'm doing, I run this house," that sort of thing. You can't talk to her or tell her about anything.' And, 'You can't argue or remonstrate with her, because she's just not listening to you. She doesn't pay attention.' This distractibility, however, had certain advantages when it came to her capricious requests. 'I've got to the stage I don't pay attention, I know she'll want something else in half an hour, she says, "I want this and that," but if you talk to her about something else, she's forgotten all about it. Oh, no, she's not aggressive about it, she might grumble a bit at times, but not bad at all.' We thus have a picture of a chronically over-active but readily-fatigued woman, distractible, capricious, selfish, outspoken, lacking in tender feelings, lacking in restraint, so that she is greedy, extravagant, and selfish, quite without insight

Sixteen cases became well enough for discharge. Of those 16, 2 retained some delusional content; 1 of them gained insight but she also relapsed later and her future is uncertain.

Four of them were free from distortions of content but retained some slight stamp of illness in other ways. Ten cases recovered.

Of the 10 recovered cases, 1 relapsed under special stress but recovered again. Only 3 of the recovered cases showed undesirable sequelae; in 2 this amounted to a reduction in the efficiency and attention to niceties; in the other there developed a chronic condition of over-activity with carelessness and lack of restraint, but while this may in part be due to the damage caused by operation, the virtual certainty that it is a true hypomania cannot be discounted. In the other 7 recovered cases the personality changes operated to the advantage of the patients and their associates rather than otherwise.

We may now consider the case-material of the group as a whole with a view to discerning any broad trends which may have helpful prognostic significance.

A curious and unexplained fact is that 33 out of the 35 patients in this group were women. The ratio of women to men in the total series is 185 to 115.

There was no correlation between the degree of recovery and the age of onset.

There was some correlation, however, between the degree of recovery and the duration of the illness. Of patients ill for more than 10 years, 2 out of 10 were discharged, but neither was fully recovered by 2 years after operation. Of patients ill for between 5 and 10 years, 2 out of 7 were discharged, but only 1 of these was fully recovered by 2 years after operation. Of patients ill for less than 5 years, 12 out of 18 were discharged, of whom 9 were fully recovered. As in the purely schizophrenic cases (without affective colouring) a somewhat critical point in the illness seems to have been reached at about 5 years after onset, after which recovery appears less likely.

There was some correlation also between the degree of recovery and the type of pre-morbid personality. Of the 35 patients, 4 were considered to have had personalities approximately within normal limits before the illness; all 4 were discharged, 3 of them

domestic friction as inevitably arose. He was amazingly patient with and good to her, but he was bound at times to be critical in the interests of family welfare. This she was, with her lack of [illegible]

[illegible] terms to how she was put upon by her stingy, mean, cruel husband. But she said this in his presence, and did not use such terms behind his back. The result was a distressing one, except to the patient, and the situation was borne by a strong and phlegmatic husband, still fond of his wife, with fortitude so that he still much preferred her to be with him thus, than away from him and wretchedly ill. The operation itself, it may be noted, had been without event except for a slight left-sided haemorrhage towards the end. One wonders, none the less, whether there may not here have been bilateral drainage to area 13. By 2½ years after operation she was rather steadier.

We have now considered these 35 cases, and we may briefly recapitulate the changes in them that we have seen.

All 35 patients survived the operation, though 3 of them died within the ensuing 13 months. One of these died from unrelated causes. The second death occurred in the only case rendered worse by operation, and who was worse both as regards behaviour and physique. Although the final cause of death was bronchial pneumonia, her noisy post-operative state had necessitated generous sedation which had in all probability contributed to the final outcome. Further, a progressive physical decay, though without obviously localized cause, was presumably attributable to operative damage to autonomic mechanisms which help to maintain vitality. Similarly, in the third case, who survived for more than a year and showed no obvious cause of death, there was an insidious enfeeblement probably also due to obscure autonomic damage occurring as a result of operation.

One patient had 2 epileptic fits shortly after operation, but none in the ensuing 29 months although she took no medication.

Four patients were virtually unimproved.

Nine patients showed a significant degree of conduct improvement.

Five patients showed not only significant conduct improvement but a much increased freedom from distortions of content though they were not well enough for discharge in the available circumstances.

not recovered. But all 3 had been ill for more than 5 years. Thirteen patients showed both manic and depressive features, of whom 5 were discharged and 3 of those were recovered; 8 out of the 13 in this sub-group had been ill for more than 5 years, and the 5 discharged patients included 2 of them. Nineteen patients showed depressive features only, without manic features, and 10 of these were discharged, 7 of them recovered; 6 out of the 19 in this sub-group were ill for more than 5 years, and 1 of those 6 was among the discharged cases. The figures have no statistical significance, but their trend might suggest that the addition of manic features to the illness indicated a more malignant condition with greater resistiveness to recovery.

With regard to the possible prognostic significance of response to previous treatment, no inferences can be drawn. Fourteen cases had had no special treatment, and 1 had had only continuous narcosis. Of those 15, 5 patients were discharged after leucotomy, of whom 3 were recovered.

One case had had deep insulin without benefit and without other treatment, but recovered after operation.

Thirteen cases had had electroplexy without other treatment. Of those 13, 5 had shown no benefit, but all were discharged after operation, 3 of them having recovered. The other 8 had shown some response to the treatment, but only 2 were discharged, of whom only 1 was fully recovered.

The remaining 6 cases had had both electroplexy and deep insulin treatment. One of them had had 2 courses of the latter, with response to the first but not to the second, though she still responded somewhat to electroplexy: she was unimproved by operation. The remaining 5 cases had shown no response to deep insulin, but 2 of them had shown some response to electroplexy, and both were discharged though only 1 was fully recovered; the other 3 had shown no response to electroplexy, but 1 of them was discharged recovered.

Thus, the only case improving as a result of deep insulin did not improve following leucotomy, and more cases improved after leucotomy when they had not responded to electroplexy than improved after leucotomy when they had responded to electroplexy; but when the duration of illness in these two

recovered, and the fourth free from distortions of content despite an illness of 15 years' duration. Sixteen were considered to have had schizoid personalities, in the sense that they were introspective, lacked drive, tended to retreat from competition, and showed an absence of warmth in social relationships; of these, 8 were discharged, 7 of whom were recovered, and another would have been well enough to live outside in sheltered circumstances had such been available; but 1 of the 7 recovered patients relapsed. The remaining 15 cases were considered to have had unstable personalities, characterized in some instances by erratic and moody behaviour with failure to adjust, in other instances by over-sensitiveness with undue worrying with or without marked rigidity, while some showed a combination of both; of these 15, 3 were discharged, 2 of whom were recovered, while a fourth remains in hospital very much improved.

Four of the patients showed a very slow recovery. In 1 case, despite some immediate improvements, the patient did not speak normally until 7 months after operation, though she was fit for discharge within a year. In another case the post-operative improvement from what looked to be hopeless deterioration continued over a period of 2 years to reach a point where the patient's return home was a success, though it had been a complete failure when unwisely insisted on by the family within the first 12 months. In 2 other cases, despite immediate improvement, gross abnormalities persisted for nearly a year after operation, later to disappear.

As with the pure schizophrenics (without affective colouring), the combination of a definite (as opposed to insidious) onset of illness coupled with the development of stupors at one time or another was found to have favourable prognostic significance. There were 16 cases showing this combination of factors, of whom 12 were discharged and 7 were recovered. In fact, 12 out of the 16 discharged cases and 7 out of the 10 recovered cases were drawn from this sub-group. Further, 3 of them had been ill for longer than the critical period of 5 years.

As regards the type of illness, the schizophrenic component in all these patients was much the same, and of a catatonic variety.

As regards the affective components, 3 patients showed manic features only, of whom 1 was ultimately discharged though

(13) The figures, though not statistically significant or near it, may slightly suggest that the addition of manic features to the illness tends to militate against recovery.
(14) As with the purely schizophrenic cases, a history of definite onset coupled with the development of stupors was of favourable prognostic significance.
(15) As with the purely schizophrenic cases, there appeared to be a time factor militating against recovery which became critical at about the fifth year of illness.
(16) The previous personality appeared of importance in the attainment both of recovery and of improvement. Those with approximately normal pre-morbid personalities did best, those with schizoid personalities did intermediately, and those with unstable personalities did least well.
(17) Response to previous treatments, whether favourable or otherwise, was not of prognostic significance as regards response to operation.
(18) The recovery rate in this group of patients was very nearly twice as great as among the schizophrenics without affective colouring, though, as regards the duration and extent of the psychoses, there seemed little to choose between the 2 groups.

sub-groups was taken into account, it was found there was no appreciable difference in the results.

There are, therefore, no figures in this group to indicate that response to previous treatment is of good prognostic significance.

SUMMARY

(1) Thirty-five patients were considered to have been incontestably schizophrenic but with the addition of manic or depressive features or both.
(2) Thirty-three out of the 35 cases were women.
(3) Three patients died, 1 of unrelated causes, 2 of conditions decisively influenced by a progressive enfeeblement possibly due to operative damage to autonomic mechanisms.
(4) One patient developed post-operative epilepsy on the second day, but has shown no recurrence, without medication, in the ensuing 29 months.
(5) Only 1 patient, who later died, was obviously worse after operation. One other, who died 13 months after operation, was significantly improved in conduct and capacity for enjoyment until overtaken by an unexplained but progressive physical decay, beginning in about the tenth post-operative month.
(6) Four patients were virtually unimproved.
(7) Nine patients were significantly improved in conduct.
(8) Five further patients were significantly improved both as regards conduct and mentation.
(9) Sixteen cases became well enough for discharge, of whom 2 relapsed but 1 recovered again.
(10) Ten cases were recovered.
(11) Three of the recovered cases showed post-operative changes operating to general disadvantage: in 1 of them these appeared to be due to the development of hypomania rather than to surgery alone.
(12) These cases have been observed post-operatively for between 24 and 36 months. One case has been at home for only 15 months after recovery from a relapse under special stress. The others have been at home for between 1½ and 2½ years.

Two patients were operated on in their fourth attack, which had lasted for 5 years and for 4 months respectively.

Four patients were operated on in their fifth attack, which had lasted for 8 years, 19 months, and 1 month respectively.

One patient was operated on in her sixth attack which had lasted for 5 months.

Two patients had had very numerous attacks: in 1 case these had recurred over a period of more than 30 years, and many had been tided over by nursing care in a wealthy home without admission to hospital, so that they could not be accurately counted; in the other, after one attack with spontaneous recovery in a few weeks, there followed a period of 5 years during which the state fluctuated so that the patient was never well for more than a week at a time, and usually only after electroplexy.

As to the actual state of these patients at the time of operation, it may be said that only 2 of them were reasonable.

CASE 240, page 278. A 39-year-old woman in whom the attacks had been almost continuous for 5 years in the absence of electroplexy, was distressed by her long separation from home, on which she brooded. But she was clear in mind and without distortions of content, though she had no insight into her periodic attacks beyond the knowledge that during them she lost appetite and weight. In fact, during such times she misidentified all around her, believed herself to be under hypnotic influences, had hallucinations of her name being called and bizarre auditory messages of disasters overtaking her family, and was, after a few days of apathy, combative and destructive with much hostility. She herself professed amnesia for these experiences in a rather convincing way.

The other reasonable patient, aged 26 (CASE 248, page 284) and in a remission from his fifth attack, had much insight and showed no distortions of content, but was markedly obsessive and circumstantial in conversation while betraying the minimum of emotion even in discussing painful and personal misfortunes.

There were 6 patients who were accessible without being fantastically psychotic.

CASE 243, in her second attack which had lasted for 13 years and had always been characterized by unpredictable disturbances of behaviour rather than by florid delusions or hallucinations, talked woolly philosophy in between attributing her illness to a mild

CASES WITH RECURRENT SCHIZOPHRENIC ILLNESS

THERE were 19 cases who had experienced recurrent schizophrenic illnesses with remissions.

It is impossible to feel fully assured of the completeness of every remission in each case, but with 4 exceptions there can be no reasonable doubt that the patients returned to their pre-morbid normal in some of the remissions and to something very near it in all of them.

The uncertainty in the 4 exceptions arises from various causes. In 2 instances the last remission had been more than 10 years before, with consequently uncertain memory in those available to give information; in one there was no available witness except the patient, and he was virtually unchanged by operation; in the fourth instance the credibility of the witnesses was suspect. But these 4 patients had at any rate become sufficiently well to undertake such activities as: travelling alone to South Africa and back, completing a course of study as physio-therapist, and getting married; travelling alone to and from South America and subsequently farming; supporting self and wife by working as a carpenter, in addition to joining the National Fire Service; being employed for 10 years, though with many changes, in domestic service, when servants were at a less extravagant premium than now. There seems no doubt, therefore, that these patients cannot have been grossly psychotic, and it must be presumed that their remissions were at least of good quality. The evidence is such as to justify the belief that we are here dealing with truly phasic conditions, rather than with recurrent exacerbations of a chronic underlying state.

Five of these 19 cases were operated on in their second attack, which had lasted for 13 years, 12 years, 4½ years, 22 months, and 17 months respectively.

Five cases were operated on in their third attack, which had lasted for 9 years, 5 years, 17 months, 12 months, and 5 months respectively.

collection of drawings, some of which he produced. These were done on both sides of each page of a series of drawing books. They portrayed a fat, blonde, smug woman with Mongolian eyes and a mouth slightly open to display rabbit's teeth. Every drawing appeared to be of just the same woman, but the patient said that each was of a different person. He had no insight, nor seemingly thought of doing anything but his daily routine, but he was a ready conversationalist and distortions of content were not to the fore.

Then, there were 5 patients who were also accessible but who showed more florid psychotic manifestations.

CASE 242, page 289. A woman of 37, in her fifth attack which had lasted for 8 years, was manneristic and giggly; she looked alert and sly, smiling fatuously but darting sudden glances; she muttered and mumbled but gave sudden outbursts of clearly expressed, staccato remarks; she said that she had 'brain trouble' but that she was running a big textile business of which the hospital formed the premises and the patients the employees; she admitted to auditory hallucinations, and said 'they are not very pleasant and I would like them more aristocratic.' She was described as 'for the most part inclined to be very noisy, she flies all over the place, striding round without any sort of purpose, interfering with everything, snatching up the vases and taking them into the kitchen and filling them with hot water. She is terribly destructive with her clothes. . . . She knows all the songs, picks them up ever so quickly, and she simply yells them. She abuses everyone around her, but she doesn't use very bad language, there are many worse than her. I can tell you the sort of thing she says: one day as I was coming back from a meal she suddenly shouted as I came in, "Don't you bloody fret, I don't worry about you, you prominent looking thing, you'd like to join the Liberals." She's quite unemployable, she'll take a broom and sweep sometimes, but in a wild way. She won't do occupational therapy, she won't even pull rags, though you might think from the way she tears her dresses it would be just the thing, but the very fact that she's been asked to do it and that there are a few more people doing it round the table will put her off. She has fleeting ideas of all sorts of things, but I don't think she has any fixed delusions. Oh, did she talk about a business? Well, I think you'll find she's just as likely to be talking about something quite different to-morrow.[1] She's faulty in her habits, not always but sometimes, and more often wet than dirty. Sometimes she's quiet enough. . . .'

[1] True.

anaemia and dully discussing a vague syndrome called 'nerve-control.' She was in fact a dangerous woman, who struck out freely, smashed the crockery, made determined attempts at escape, and homicidal assaults. CASE 255, seemingly recovering from his fifth attack with the help of electroplexy, was also a vague philosopher, detached from reality; he attributed his illness to a brain storm induced by getting into a sentimental mood while playing golf; this led him to lament the shortage of golf balls in between telling of a girl to whom he believed himself half-engaged (though he had met her casually but once some years before) and minutely describing a particular kind of putter. CASE 244 was very depressed and tense, distressed by hurtfully critical hallucinatory voices, torn by some inexplicable conflict as to whether she should help the British or the Germans, tormented by her thoughts till she was sometimes inarticulate, suddenly breaking through her hesitations to declare that she was the Queen, then rejecting the idea as intellectually impossible, and feeling herself influenced by all the metal in her environment, especially the radiators. But she retained some insight and had good rapport. From CASE 246, much improved after electroplexy, no distortions of content could be elicited except that she found strange co-incidences: conversations which she had had or things which she had thought were reproduced in the newspapers or by the wireless: her mother, she said, had often found the same. When encouraged to discuss it, she said that these were arranged especially for her by the King, possibly by the government. CASE 251, page 293, a woman of 35, in her fourth attack, was elated but emotionally labile; she was off-hand and fatuous, telling in a manneristic way of seeing fiery crosses in the sky, mentioning religious matters and explaining in the next sentence that she had a 'kink in the urethra'; she was impulsive, sometimes because she felt hostile, sometimes on account of strange thoughts which came to her as revelations, such as that if she climbed on the roof the world would be benefited. But she was fully in touch with her environment and capable of reasoning and thoughtfulness for others. Some previous attacks had been more grossly schizophrenic, but in all there was a manic colouring. CASE 245, page 281, a man of 54, in his second attack which had been of 11 years' duration, subject to mumbling auditory hallucinations designed to annoy him, believed there was a mysterious plot to seize his house and property, as to which he was unwittingly inconsistent and illogical. He was a markedly obsessional man, and he spent some of each day drawing in the privacy of the lavatory. He had in this way amassed a great

state, disorientated in place and time, but able to observe that she hated lunatic asylums and had dreadful thoughts, to express the delusion that her sister was in the same ward, and to say with inappropriate laughter that she felt ill. The fourth, CASE 253 (page 295), emerged from semi-stupor to make occasional remarks: 'It sort of all depends on what happens in the kitchen where they shot Alice, shall we all have some whisky, of course Dorothy might be going to the Bentleys', where are those Chinese drinks you left outside with the icicles, you know what a cheque is, you know what a guarantee is....' Another emerged from semi-stupor only slightly more coherently, and made efforts at co-operation. The sixth patient said nothing spontaneously, preferred to answer by gesture, and though quite alert alternated between ignoring the examiner and making sudden staccato answers of random veracity. He was in the ninth year of his third attack.

That was the sort of clinical material of this group with recurrent schizophrenic illnesses.

Results

All the patients survived operation.

Death

One was drowned in the eighth post-operative month. He had improved to an extent that he had complete insight, was free from distortions of content and thought disorder, was equably cheerful, and was hopefully and confidently planning for his future. He had shown no significant abnormality of behaviour. He remained, however, what he had always been—an unusual personality. No doubt is felt that this drowning was accidental. The patient set a high premium on physical fitness and athletic prowess which he expressed in a fondness for running and swimming long distances. It was in course of a long-distance swim at sea that he was drowned. He had been overtaken at some distance from shore by a boatman who had advised him to return, but the patient, then swimming strongly, had replied confidently that he was quite all right. The possibility of post-operative epilepsy cannot be ruled out, but there is no special reason to

Case 247, page 291. A man of 49, seen in his second attack which had lasted for 4 years and 10 months, explained that he had been brought to the hospital through the requirements of the state. He was entirely preoccupied with a set of ideas which shifted only slightly round a fixed central theme. 'There's been a question of ways and means of conversing through the world, hasn't there? Thought transference and telepathy, there's television attached to it, and X-rays and that. I don't take the interest in it that they do, they have the actual instruments, and they're dabbling about in the way of experiments. It's a continual worry, pitch all the time to hear something or other. In my opinion, it *is* going to turn out a nuisance, as you say, it's on the go all the time, every working hour of the [illegible] chosen by [illegible] hat [illegible] d a respite and was allowed home; but he feared 'from what they said' that the experiments were to be continued, probably with fatal effect. Secondary to this, and arising out of his experimental skill and technical knowledge, he believed that he had been promoted to be superintendent of the hospital, and was being kept by a usurper from his rightful place. Despite his anticipation of a fatal outcome, there seemed to be no depression, though there was much worry, sullenness, and surliness with noisy abuse and threatening behaviour. Electroplexy had made no difference.

Case 239. A sprightly man of 41, in his fourth attack, showed much push of talk, saying that he was sixty million, nine thousand, eight hundred and ninety-three years old, was able to extinguish the stars and make meteors shoot across the sky by command, could strike his wife 200 miles away by telepathy and by telescopic action of his arms, that he was 50 miles high and had put Mount Everest, 'a kind of a kid's sand-castle,' in place some years ago. He said that he slept 'quite well with other patients' drugs, it's like onions'; and explained that the virtue of onions was distilled through the fingers on to cigarettes, dissipated thence by the smoke, and then inhaled by *anyone in the vicinity, so that all thus got the benefit of* onions: other patients' drugs were imparted in the same way. Deep insulin had not improved him.

The 2 other floridly psychotic patients, in their second and sixth attacks respectively, were at much the same level.

The remaining 6 patients were much less accessible. Two of them were stuporose; another was in an anxious and bewildered

at the same time she became preoccupied in a melancholy way over the death of a remote cousin with whom she had had no personal connection: she also thought that people were talking about her in derogatory fashion. This continued for some weeks. She then began to expect gas attacks and the dropping of bombs filled with germs; she felt herself possessed of secret knowledge in regard to this, and felt a need to communicate instantly with the head of the Royal Air Force. She became more overtly depressed, talked of suicide, was increasingly agitated, and smashed a window because it had been revealed to her that if she did so the sufferings of the world would be stopped. She believed herself to be hypnotized, and that people were making her blind. She was admitted to hospital whence she repeatedly tried to escape. Continuous narcosis, given on two occasions, did not improve her. Deep insulin treatment was abandoned after 17 days as she proved unmanageable. She made suicidal attempts and showed impulsive outbursts. She responded fairly well, however, to electroplexy though she readily relapsed without it. After 2 years and 3 months she was considered well enough for discharge provided that she continued with electroplexy as an out-patient, but within 3 weeks she had to be re-admitted owing to impulsiveness at home. In hospital she had periods of being pleasant, co-operative, helpful, and in excellent touch with her surroundings, but these were usually related to her having had electrical treatment, in the absence of which she would slide back into a state of disinterested apathy, after a few days of which she would mistake identifications, and feeling herself under hypnotic influences with auditory hallucinations conveying messages of disaster, she would become hostile and combative. A brief trial at home again after 3 years of illness was unsuccessful. She continued in this alternating state, with occasional spontaneous remissions, but usually with improvement only after electroplexy, and with the disturbed phases coming at intervals of 1–3 weeks, until operation was decided upon after the illness had been in progress for 5 years and 3 months. After operation the phasic quality of the illness disappeared. The patient's mood was also equable, but she became continuously paranoid about her fellow-patients, whom she believed deliberately annoyed her, and she became liable to attack them on that account though violence was now controllable by sedation. At interview she was still capable of maintaining a good appearance, though her paranoid preoccupations were apparent; she denied hallucinations, or ever having had them, though it appeared that she was still hallucinated in fact;

invoke this as a cause of death. Permission for autopsy was unfortunately refused.

Epilepsy

Four patients developed post-operative epilepsy. One man had 1 fit in the third post-operative week, but has had no more (in absence of medication) in the ensuing 30 months.

One man had 2 fits in succession in the fifth post-operative month, but (with medication) has had no more in the ensuing 24 months.

One man had 3 or 4 fits in succession in the eleventh post-operative month, and (without medication) a further 3 or 4 in succession in the twenty-fourth post-operative month. There were no neurological signs, but the fits started on, and affected more markedly, the left side. One man had 1 fit in the thirteenth post-operative month and another 5 days later. A third followed, despite medication, in the fifteenth post-operative month.

All these patients were men. No history of alcoholism or head injury was obtainable. The ratio of men to women in this group was 8 : 11. Here again, as in the group of purely schizophrenic cases, there would seem a significantly greater liability to development of post-operative epilepsy in schizophrenic men than in schizophrenic women.

Patient worse after operation

Of the 18 patients still alive, one may be considered worse as regards the illness.

This was CASE 240 (see page 273), a woman of 39, previously referred to as 1 of the 2 patients who were pre-operatively reasonable when seen at their best. At 30, 10 days after the birth of her child, she had suddenly developed a morbid interest in religion to the exclusion of other topics with auditory hallucinations, and said that she was a psychologist in telepathic communication with various people Admission to a mental hospital had been advised, but was decided against by the relatives, who were justified in so far as the patient seemed to recover entirely within a few weeks. At 33 she rather suddenly became restless and agitated, decided that she must do some war work, and experienced a sense of mission in this:

paranoid, and had regained urinary control. She was able to have town parole, but she was an awkward and difficult patient in the sense that she was touchy, resentful and required special handling, in the absence of which she would be noisy, sarcastic and hostile. She was apathetic rather than discontented, more lacking both in warmth and insight, and subject to ideas of reference. She seemed no longer to show the same potentialities for recovery that she had shown before, and though she was no longer physically disturbed in the same way as before operation, her average level was on the whole a deteriorated one. It was likely, of course, that this might have happened in absence of operation.

Unimproved case

One patient was unimproved as regards the illness.

Case 239 (see page 276) was worse in that he had developed epilepsy, with 2 bouts of fits in the eleventh and twenty-fourth post-operative months. This was the 41-year-old man in his fourth attack, who had planted Mount Everest. 'My first wife was Goody Two Shoes, she was four foot six, she left me 59 million years ago, oh, she's 60 million. Well, she's grey, but she doesn't look too old. . . .' He had been a mummy in a sarcophagus in the British Museum for many years, his blood having previously been treated so that he did not need food. His hallucinations were perhaps somewhat more vivid. He was still exalted and somewhat noisy, still unreliable in behaviour, but he was rather more readily employable after a year, and over 2 years he was less combative. Any degree of improvement, however, was negligibly small.

Conduct improvement

One patient showed slight but definite improvement of conduct.

This was Case 245 (see page 274), the man of 54 whose second attack had lasted 11 years, with hallucinations of mumbling noises intended to annoy him, and delusions that his house and property were to be seized through a mysterious plot. He had had brief spells of friendliness pre-operatively, but after operation these were longer and more frequent, lasting about 2 months instead of about a week. He was also less easily upset, and when he became ill-tempered it was more quickly over. His drawings, however, had deteriorated; at first they were still of the same woman but more slovenly in

she admitted, however, to a marked increase of irritability, and she described two new symptoms, urgency of micturition leading to incontinence of urine, and sudden accesses of crying or laughing for no good reason (affective incontinence) with little in the way of accompanying subjective emotion. She presented a balanced view of her post-operative state, claiming that she was improved in that she felt steadier and less moody, had gained weight, and slept well, but recognizing that she was not recovered in that she was irritable, lacked control over crying and laughing and over micturition; but she did not have insight into the development of her chronic paranoid state. Her behaviour, likewise, remained on a level between her previous extremes; she was now always resistive over getting up in the mornings, she was repeatedly noisy and abusive to other patients, and showed by her actions that she thought they were talking unpleasantly about her even when they weren't. A year after operation she was undoubtedly worse. Her paranoid ideas about her fellow-patients were entrenched, and were constant. She was again certainly hallucinated, hearing voices call out her name to annoy her, and others telling her that the doctors had got hold of her child and were bleeding it to death; she believed that the patients shouted these things, but she could never locate their origin; she believed it to be part of a pre-arranged plan, and that the patients would change places as soon as the voice had called out in order to confuse her as to its source; other patients, she said, swore at and abused her continually. She was preoccupied with these things to the exclusion of other interests. She had become exceedingly noisy in her anger, sarcastic, sneering, and sadly changed. Her affective incontinence had stopped, but her urinary incontinence continued. In behaviour she was resistive, often hostile, and could not be relied upon. She could still respond to special attentions and was, for example, excellently behaved at interview, while she would also behave very nicely if the nurses got her on her own, and when her relatives came. But the general tenor of her way was a downward one, with increasing resentment, a chronic instead of an intermittent disturbance, and a deterioration of personality. It is true that she did not show the worst that, in her acute phases, she had shown before: that she was still able to use the recreational facilities, playing badminton, attending dances, going to the cinema But she had lost her periods of normality with their pleasantness and comparative happiness, and she lived now in a smouldering discontent. The second and third post-operative years brought improvement, in that she lost her hallucinations, was less overtly

what she would be like from one day to the next. After operation her spontaneity was much reduced; she stopped barking and she scarcely spoke but sat muttering to herself; she was not resistive or irritable; she was clean and only occasionally wet the bed at night. She would do some sweeping if started on it and supervised. Her violence had disappeared except for a solitary occasion, and she had had only 1 attack of screaming in 6 months. At interview she was very retarded but would speak, given time, in a loud, clear voice: she was 2 years out in her age and 10 years out in the date: she said that she used to bark 'because the dog couldn't bark,' but she would not say more than that: most questions she refused to answer, but showed frowning and wrinkling of the forehead, rubbing her head with her hand, mouthing and grinning. A year after operation she was much more accessible so that it was possible to hold a simple conversation. She was orientated in place but not in time; she could explain that she was 'unhappy, terribly unhappy, I'm broken-hearted over something; well, it's just that people of different nations seem disappointed.' She could describe her auditory hallucinations. Some of her answers were quite irrelevant, and she showed affective incongruity. For the most part she spent her life sitting immobile, looking at the floor with fixed gaze; she could only occasionally be got to do a little work. In some respects she had reverted towards her pre-operative state in that she had had several screaming bouts, had shown resistiveness again, especially at bath times, and was again incontinent of urine and faeces from time to time. She had, however, been given some electroplexy in the hope of increasing her spontaneity, and it seemed to be in relation to this that she had become worse again. Two years after operation she was no longer incontinent, could sustain a conversation, and was capable of ward work under supervision. She was still erratic and hallucinated, indolent, and seemingly with no prospect of recovery. But she is still at a much better level of behaviour than she was before the operation.

A man of 37, in his third attack which had lasted for 9 years, pre-operatively violent and inaccessible, was post-operatively amenable and friendly. He was still deluded, hallucinated, quite out of touch with current affairs, and unable to sustain a rational conversation for more than a few moments. But it was possible to examine him (previously he had been very threatening but now one could actually estimate the blood pressure), he had ceased to be noisy or destructive, the rudiments of his good manners had returned to him, he was no longer incontinent, and he could be taken out to public entertain-

execution; later, he unexpectedly began to extend his range, but his draughtsmanship (never good) had become careless and less precise.

Three patients showed marked improvement of conduct.

One of these (CASE 243, page 273) was a 49-year-old woman, in her second attack which had lasted 13 years, and who has been described as philosophizing in woolly fashion, detached from reality, never showing florid abnormalities of thought, but unpredictably erratic in behaviour, with violence, homicidal assaults, and attempts at escape. Post-operatively the atmosphere surrounding her was clearly, if subtly, different. There was no question, as there was before, of 'You'll be all right seeing her here alone, as it's one of her good days to-day.' It was plain that no hesitation was felt over leaving her alone with other people, and she was approached with an easier friendliness. She was placid, indifferent, and unspontaneous; she still preferred pseudo-philosophical evasions to factual answers but she spoke only in answer to questions. 'Ah, that's a question, a great question, it's a question really which none of us has ever solved, isn't that so?' 'Ah, but it's not by talking that we get things done. Actions are better than words, are they not?' 'No, I'm not interested in doing it, but occupation is better than idleness, is it not?' She was fully content with not solving questions however, showed no sign of activity, and seemed to prefer idleness to occupation. But she looked after herself, fell in with the routine (which she had not before), was more friendly, and showed no violence. Over the ensuing 2 years she has remained much the same: she has resumed the piano after many years away from it: she reads and sews: she is more accessible and less asocial: she is often sarcastic but never violent. Always idle, she is so still, disinterested for years past, she is still disinterested. She has no grasp of current affairs, is entirely vague in imputing war-time activities to her relatives though knowing the war long to have been over. Her drive is reduced, but she has gained in contentment and is far more manageable.

A woman of 40, in her third attack which had lasted for 4 years, was 'less co-operative than a wild animal.' She varied between shouting incoherently all day, resisting all attention, posturing and throwing herself on the ground barking like a dog, to becoming silent, withdrawn, retarded, and dull, sometimes to the point of stupor. She was incontinent of urine and faeces. She was at any time liable to become violent, abusive, and obscene. These variations in conduct did not show regular phases; it was impossible to know

and more outspoken. He is more aloof, with less affection and warmth. He is less thoughtful for others, less sensitive, and less aware. He takes things for granted and never expresses appreciation. It is difficult to sort out which, if any, of these traits are part of the illness and which are sequelae of the operation. The aloofness and lack of warmth are perhaps schizophrenic symptoms, to which the operation has added its quota. The irritability is perhaps due both to the post-operative lack of restraint and to the adverse effect of operation on an already unstable electro-encephalographic rhythm (with sensitiveness to sugar fluctuation) no doubt related to the occurrence of 2 fits in the fifth post-operative month. The outspokenness, the increased bluntness, and decreased fineness are presumably operative effects, and related to the post-operative disappearance of the meticulousness and obsessiveness which had been so marked a feature of the previous personality.

Thus, we have here a case which might have been considered worse in that a periodic psychosis had been rendered a chronic one, while an attractive, sensitive personality had lost his finer attributes. But there is more to be said than that. Four out of the 5 catatonic attacks appeared to be in considerable measure reactive to situations which taxed the patient beyond the powers of his adjustment; at any rate, there were powerful environmental factors. The patient is now less sensitive and less delicately balanced, and to that extent more stable. That this may reduce the liability to further attacks is suggested by the absence of any such exacerbation over the post-operative period of nearly 3 years, whereas the attacks were at yearly intervals or less before. Further, the patient has been at work and earning his living, since operation, for a longer time than in all the previous 6 years put together. While, therefore, the patient's potentialities have undoubtedly been reduced, so have his immediate liabilities, and in terms of efficiency of function he cannot be classed as other than improved, and in so far as he is free from distortions of content he has recovered.

An interesting example of another very slowly progressive improvement occurred in Case 252,

a man of 27, who had had a fluctuating attack at the age of 21, with spontaneous recovery after some 5–6 months. He soon after joined the Army and was promoted to corporal before being invalided after 3 years owing to a second attack, which also ended in recovery

ments. Over the post-operative period of 2½ years the hallucinations seemed to fade entirely, leaving an empty and disintegrated personality, but one that was amiable and capable of some social functioning in an automatic way.

Discharged patients

Four patients, though not recovered, became well enough for discharge. Two are of some special interest in that one of them is a further example of the replacement of a phasic condition by a chronic one, with later recovery, and the other is a further example of a very slowly progressive improvement.

CASE 248, page 273. A youth (for so he seemed) of 26 with an obsessive schizoid personality, was operated on during a remission after his fifth attack of catatonic schizophrenia in nearly 6 years. The attacks had tended to become longer and the recovery from them less complete. Pre-operatively he had been affectively flat; post-operatively he was more so, with increased apathy and slowness. The periodic condition had given place to a milder but chronic state, characterized by secretiveness and suspiciousness, sly and inappropriate smiling, preoccupation with the hidden significance of certain numbers, colours, and signs, notions that if a person coughed twice then the second cough was a sign to cancel anything that had just been said, that the rightness of conduct was indicated by the position of knives on the dining-table, and by some exceedingly complex ideas about the meaning of time and the timing of acts. He felt himself to be in a test situation, and that people were organized to annoy him for some unfathomable purpose. Pre-operatively the attacks had cleared sometimes spontaneously, but also, it appeared, with the help of deep insulin, modified insulin, thyroid extract, and even stilboestrol. After operation he was given a further course of deep insulin without effect, and no other treat- [illegible] home after 8 [illegible]

He was, however, well enough to adjust to life at a rehabilitation centre, where he kept his thoughts to himself, and subsequently to work on the construction, maintenance, and repair of wireless sets, of which he had had much previous experience. Thirty-four months after operation, and 26 months after his discharge home, his condition has changed in that he is quite free from distortions of content. His personality is altered for the worse, in that he is more irritable

that he was hallucinated, was depressed, and was reacting badly to his thoughts, he was given some treatment by electroplexy, with great effect. When seen a year after operation he was cheerful, equable, interested in life and outside affairs, and working steadily within the hospital. He was not in the least preoccupied with religion, nor could he be made to become so. He denied hallucinations, though he recalled his former ones, as well as the distortions of sounds that he had heard as words. He yielded no delusional material and appeared convincingly free from ideas of reference. He readily agreed that he had had these before, and said, 'I think it was all silly. Mental patients do get ideas.' Painstaking efforts were unsuccessful in eliciting any psychotic symptoms from this man, except that he had little insight into his worsened condition before electroplexy, and said he did not know why he had been given it, but he supposed 'they thought it was for the good of his health.' He was in touch with current affairs, orientated in all spheres, could retain 7 digits and reverse 6, made only 2 mistakes on serial subtraction of 7 from 100, could explain the difference between a lie and a mistake and between a boy and a dwarf, and could give a full account of the cowboy story though without remembering the details. He could, however, remember only 3 out of 6 items in a simple memory test with name, address, and flower, and could get right only 1 simple subtraction of money out of 3 without using pencil and paper. Apart from these last two items his performance was within normal limits for his educational level. His wife was hesitant to accept him home after her week-end experiences, but he was finally discharged from hospital 18 months after operation. He got work as a painter in a building firm and was well thought of there until, after several months, he was found painting his own bicycle with the firm's paint during working hours; as the bicycle was new and did not need painting, this seemed an oddly irresponsible act. He then worked for the water company for a few weeks before deciding, for financial advantage, to go to a school of mines with a view to working in the pits. He did this, completed the course, and has been working as a miner for the past 12 months. Superficially, he appears well. His physical condition is excellent, he is in touch with current affairs, shows interest in life and in his work, is spontaneous and cheerful without abnormality in what he thinks or says. But at home he shows some curious conduct. Although he is perfectly all right with the neighbours, who notice nothing amiss, and although (as his wife says) 'he is not insane, he can talk on any subject,' his behaviour with his wife and mother-

after a few months. A third attack supervened, however, within a few weeks and he was operated on after this had lasted 12 months. During this 12 months, phases of noisiness, destructiveness, and resistive excitement had been prominent, but there had been periods of comparative normality occurring in irregular fashion, in which the patient would be amiable, co-operative, and pleasant though always uncertain. But these last had become increasingly rare and increasingly short-lived. There had also been brief periods of semi-stupor. He had a single fit 3 weeks after operation, but was otherwise much improved and within a few months was well enough to spend week-ends at home. He was alert, tidy, with good rapport, behaved naturally and talked spontaneously. He showed some insight and was able to discuss his illness as such in an objective way. But as soon as the conversation became other than superficial, it was apparent that there were marked distortions of content which had by no means all been previously present. He was a religious man, and saw religious significance in any trivial event: the score at a cricket match, innocent remarks and gestures, poking fires or pulling lavatory chains, all had obscure religious connotations, and vaguely acted as reminders that he was a Roman Catholic in a predominantly Protestant community. All these actions were done on purpose and for his special benefit, though not in hostile fashion. Further, he distorted sounds actually occurring so that in some curious way the sound became a voice, although it was not one; all sorts of incidental noises would thus say to him (and he experienced it as a voice, not as a thought), 'We're in, we're in,' or 'That's bread, that's bread,' or 'That's me, that's leg,' or 'That's water, that's water.' Even these were evidently not without religious significance, for the patient explained, 'That's because there's water in the Catholic Church, but of course it's hardly possible that that water was holy water.' And once started on a religious theme, it pervaded all his thinking. This became further apparent when, on a week-end visit to his Protestant wife (to whom he had been obliged to get married with much subsequent regret and conflict which had been powerful precipitating factors in the second and third attacks), he had performed eccentric religious rituals, had expressed bitter regret over her failure in faith, tore up her photograph, burned a wedding group, and suspected her (the idea having been put in his mind by a film) of poisoning his tea. His mental state 6 months after operation thus contrasted strangely with his much improved physique, his usually normal behaviour, and superficial appearance of cheerful extraversion. Ten months after operation, as he showed

and ideas of reference) but with so little effect on the patient that his behaviour in hospital was normal; the disturbance of that behaviour on returning home where the conflicts were activated at week-end visits; the worsening of the condition about 9 months after operation, presumably as the patient's affect was returning; the marked improvement then after electroplexy, with the dropping out of the delusional content, with cessation of hallucinatory experiences and ideas of reference; the emergence, within the limits of hospital life, of a normal person; finally, on return home 18 months after operation, the phasic disturbances of behaviour not associated with disturbances of thinking, and the complete normality away from home.

The other 2 cases who were discharged but not recovered were less striking, though 1 shows the beneficent effect of happy home surroundings in contrast to the foregoing case.

A spinster of 37, operated on in the eighth year of her fourth attack, which (Case 242, page 275) has already been described, entered an apathetic state after operation, with lack of interest and drive. Her spontaneity was much reduced, and though her infrequent remarks sometimes seemingly lacked relevance, they gave no evidence of psychotic content. She was indolent and without initiative, slept and ate very well, was tractable but required much supervision in a general way. She seemed burned out. Six months after operation she was disorientated in time, but was orientated in place, knew that she was in a mental hospital, denied that she was running a textile business, yielded no evidence of delusions but had auditory hallucinations of a critical kind. She said nothing spontaneously, ignored many questions, was retarded in answering others, but, as before, sometimes muttered and sometimes spoke loudly and clearly. She was dishevelled and disinterested and appeared empty as well as being unwilling to converse. She talked to her relatives, however, and they recognized that she was very much better though commenting on her dullness and apathy. Nearly a year after operation her sister, when visiting her, played some traditional airs on a piano in the waiting-room, and the patient surprised her by singing the acccompaniments not only with enjoyment but with the correct words. This induced in the family a zeal for the patient's rehabilitation, and she was discharged at their insistence. It may be noted that, so great here was the spirit of family solidarity, they had themselves contrived to nurse the patient through all her previous attacks, without recourse to hospital,

in-law leaves much to be desired. It may be observed that these are people with low cultural standards, while the patient has some of that sensitiveness and distinction sometimes to be found in the Western Irish despite an upbringing that was primitive in material matters. Further, the patient has never quite got over having had to marry a person of different faith, as well as of different culture; the addition of 3 children to a situation of financial embarrassment complicated by his own insanity, added also to his ambivalence. There is still conflict in his mind which flares up into hostility. He would not have intercourse with his wife, and threatened to choke her when she was persistent. He would look viciously at the children and swear at them, which he never did before. He abused his wife in strange terms, calling her, 'You bastard cows and rams,' often threatened her with violence but only occasionally carried the threats into action. He would complain of the food, refused to make allowances for rationing difficulties, would search for things about which to quarrel, would be furious that unpredictable wants had not been anticipated or because the clock was a few minutes fast. He would talk angrily of emigrating and leaving the family behind. He would keep his wife deliberately short of money. On one occasion he shut her and his mother-in-law out in the street for several hours, threatening them angrily every time they approached. Another time, when home for the week-end from the school of mines, he sat down at midnight with various items for making a [illegible] ours without going to [illegible] But he was not always [illegible] my imagination, but I think it's the moon. When there's no moon, everything is all right, food all right, kiddies all right, and then suddenly....' His record length of time for being 'all right' was 3 weeks, and that was after the police had been called in in the hope of some salutary effect. The wife and mother-in-law reckoned that he was thoroughly difficult for about 75% of the time, and pleasant for the rest. Without taking too seriously the wife's suggestion of lunar influence, it seems that there is here something of a phasic disturbance, appearing mainly in the emotional sphere, and using for its expression the [illegible] 'Mind [illegible] me the [illegible] patient shows no abnormality.

The pattern of improvement is worthy of note: the immediate cessation post-operatively of tendencies to stupor and to excitement; the continuing illness (as regards delusions, hallucinations,

With sensorial tests, however, she got slower and slower, and was not pressed further. There seemed no doubt that she had achieved a striking degree of improvement, especially in the stimulating and kindly atmosphere of her home. The family were very much disappointed in her performance at this visit, and I was inclined to accept what was said, that she reached a still better level when not feeling herself in any test situation.

Case 247 (page 276), who had regarded himself as an experimental subject for the nations of the world as regards telepathy, X-rays, etc., and was operated on after his second attack had been in progress for 4½ years, retained all his beliefs at 6 months after operation. Asked if the superintendent of the hospital continued to usurp his (patient's) rightful position, he replied, 'From what I can see of it he intends to hang on to the job.' He also now said that it was generally understood that he was the King, since he was the son of the former King, but some people were stopping him from going to London to fulfil his destiny; this, indeed, seemed a new delusion as did his belief that he had 'syphilis of the stomach.' He was still hallucinated, hearing voices saying that he had syphilis, and the superintendent sending him messages through the ether contradicting something he had said when passing through the ward shortly before. He said that he felt rather miserable, as he had been kept away from home too long, but he was vastly more placid than he had been and his general behaviour was quite different in that he was no longer noisy or threatening, but seemed 'very satisfied and comfortable,' worked quite well, and was co-operative though saying little, and spent much time in reading, in which he showed good grasp. A year after operation the experiments had stopped. 'There's nothing of that at all now. Oh, yes, they *did* [he proceeded to explain about television and X-rays], but they've stopped. I don't know quite when it was they stopped. No, I don't know why, I haven't been told, I've never been told anything about it in a straightforward way.' He said that they had said he should hold the office of King, but he didn't know what was to be done about it, and he still maintained that he was by rights the superintendent of the hospital. But it certainly seemed that he was free from hallucinations and that the current day to day disturbances which he had projected so that they became external phenomena had stopped. His wife corroborated this. 'No, he doesn't say anything that's odd, or anything odd he does say is old, things he used to think and say, but no new ones. He used to say of Dr. T. that he came from Siberia, he said so when he was at home last week-end, and I said, "Of course

though they had had a terrible time in doing so; it was only the disrupting effect of the war that left them without enough family at home to carry on, so that halfway through this fourth attack they had become obliged to abandon the struggle and consent to the patient's hospitalization. In this welcoming and sympathetic home she improved remarkably; she would come down late for breakfast but made her own porridge and toast, washed up, made her own bed and sometimes others, cleaned the vegetables, did much housework, often cooked the lunch, laid the table for all meals except breakfast, cut bread and butter, etc., and would do these things not only without supervision but without prompting. She went out with the family on expeditions, shopping and to the cinema, managed small errands on her own, caused no social embarrassment when visitors came, was much interested in what she saw and learned. She had knitted 10 pairs of socks for her nephew and nieces. She was very placid and easy to get on with to the extent that the family permitted themselves the obvious exaggeration that she was right back to normal within 6 weeks of her return. She was in fact well dressed and made up, showing much more animation than before, but she was statuesque, monosyllabic in her replies, sometimes not answering at all, and waiting for very long periods before beginning her answer, what time she fidgeted ponderously, picking up bits of fluff and dust from her sleeve or the mantelpiece or the chair. She said that she had been home about a year (6 weeks) though she had correctly answered someone else who had asked the question the week before. She denied having had any treatment in hospital, but when asked if she had had an operation she said that that was so; asked how long before, she said after much thought, 'More than a year' (18 months). She appeared quite happy, though dull, and her hallucinations had disappeared. Nor could any delusions or ideas of reference be detected. She had been reading *The Count of Monte Cristo*, but could give no account of it whatever; otherwise she read only *Woman's Own*. She was not in touch with current affairs except that she had learned that dentures were provided free under the National Health Service, and on hearing this had decided to act upon it. She also suddenly asked if she should have any treatment for a lump on her head which she said she had had for a long time but which was increasing in size. She showed a large sebaceous cyst hidden by her hair, which she had forborne to mention at the hospital. She could retain 6 digits forwards but could reverse only 3; she got 2 simple subtractions of money right in her head, and was only a penny out in the third.

CASE 244 (page 274), operated on at 35 in her second attack, was post-operatively vague and content to do little. But within 12 months she was supporting herself as assistant matron at a school, at which she continued till the school closed down. She then showed some resource in finding other work, but ultimately met with much frustration which forced her to live in an uncongenial environment while unemployed. In this setting she rather suddenly relapsed in the thirty-third post-operative month. The psychosis was exactly the same as its predecessors except that the patient faced her hallucinations and delusions with a calm which contrasted astonishingly with her former agitation.

The third relapsing case had had very many attacks over a period of some 30 years. She remained well until the twenty-second post-operative month, since when she has had 4 attacks of exceptional mildness and brevity.

CASE 251, however, is worth some detailed consideration. She was a woman of 35, operated on in the fourth month of her fourth attack, which has been mentioned on page 274. She had only a left-sided operation, owing to haemorrhage. Her degree of recovery was such that a later repetition on the opposite side was considered unnecessary. Six months after operation she was lethargic, required much stimulation, and was tiresomely obstreperous to a sister who had long fulfilled the role, if so mixed a metaphor be permissible, of dominating prop. Twelve months after operation her activity was within normal limits, as was her animation, though neither was as great as before she had been ill. She showed no overt abnormality, and yet she had an awareness of herself distinctly unusual in the post-operative patient, and which one is inclined to attribute to the more limited form of operation. Whereas there are usually overt changes into which the patient has no insight, in this case there were, after a year, only subjective changes of which the patient was acutely aware. 'I just have to say to you that I've turned into a very, very dull person. I witness it, and I can't do anything about it. I suppose I'm very lucky, I'm told I've made a very good recovery and from the medical point of view I suppose I have . . . but it used to be so different, I was full of exciting ideas. . . . I don't seem to take as much enjoyment in things now, it's so dull. . . .' She did not appear in the least depressed, and she had been operated on in an elated phase. It seemed that after operation she had an affective deficit in a quantitative sense. She could not enjoy theatres or respond to films or stories in the same way; she could project herself into them, but without inward echo. Things

he doesn't," and he just let it pass. He never contradicts you now. He's improved in lots of ways; he's much better tempered, he's never been in a temper since he had that operation. He used to be terrible to me, saying he didn't want to see me again and telling everyone I wasn't his wife. When he comes home he's quiet, but beyond that he seems quite normal.' He was discharged soon after and has continued to live at home, but is indolent and inert.

Four cases recovered but relapsed. The relapses were milder than the pre-operative attacks.

One was a Chinese woman of 33, operated on in the fifth month of her sixth attack in 10 years. In 4 of the attacks there had been a marked [illegible] [illegible] [illegible] with outbursts of screaming, etc. One of the attacks was characterised by restless excitement with intermittent stupors, and the sixth by gentle self-depreciation without overt depression, vagueness, lack of concentration with wandering thoughts and speech, and erratic, restless behaviour as she was swayed by thoughts of love mixed up with religious doubts. She improved at once after operation, and after 6 months she showed no distortions of content, but her conversation moved in an all-inclusive fashion from one topic to another without obvious connection: she was very apathetic, lacking in initiative and spontaneity, finding difficulty in occupying herself but not disliking idleness, without plans or hopes or interest, careless and unmindful of the world. Twelve months after operation she was considered to have recovered; she was more animated, had plans which were related to the life situation, showed interest in her surroundings and in the future, read books, talked readily, participated in the social life of the hospital, looked after herself, worked adequately, and showed no abnormality. She was discharged and at home was found to be more stable, in the sense of reacting to events with more control, than she had been for years and years, but a more simple and primitive person than the intellectual and sensitively aware woman that she had been before. Alas, 16 months after operation she became rather suddenly suspicious and apathetic and was returned to hospital, where she believed that the late Dr. Mapother lived in the next room disguised as a woman, she received spoken messages from her sister many miles away, had a sense of mission to help the nursing staff in their duties, etc. She was in full relapse of a less colourful kind than her previous attacks.

of it, and said that she had now returned entirely to her pre-morbid normal and that, if the first operation had taken something from her, then the second had restored it. No doubt was felt, however, that in fact she had lost the insight that she previously had had. In the home she was wayward and hot-tempered in a fashion reminiscent of her adolescence; she had no insight into this and indeed showed no capacity for introspection at all. She appeared a much simpler and more automatic person. Her sensorial performance was the same as after the first operation except that she could no longer do simple subtractions of money in her head.

The other 4 cases recovered without subsequent relapse. All of them emerged from the immediate post-operative period free from distortions of content, except 1 who was euphoric and fatuous and believed for some months that the hospital was subjecting her to a memory test by repeatedly changing the names of the patients. All these patients were at home by 6 months after operation, though that is not to say that they were then well. One patient, for instance, though she had shown no abnormality in hospital, took no interest in her personal appearance, didn't bother about the state of the house, blamed other people for her own shortcomings, provided meals either very late or much too early, and laughed immoderately, even when her 3-year-old son burnt himself through her own negligence. But she improved steadily, and by 12 months no fault could be found with her as a parent or housekeeper, while socially her shrinking and inadequate personality was in some ways more satisfactory than it had ever been.

CASE 253, page 277. A housewife, though she managed the house all right, was less spontaneous and excitable than ever before, but she still became excited by frustration so that she had become markedly impatient, and developed an embarrassing habit of passing the time by singing if she were kept waiting in a queue. She ceased to do this within a year of operation, but she showed as lasting residua a certain simplicity and rigidity of mind: thus, if she went on an expedition it had to be with an avowed object, and once that object was achieved, she would return forthwith: if she decided to go out somewhere for tea, she would go and have tea, but she would not look at the shops, walk by the river, or enjoy any other diversion: if she went shopping it had to be with some special object, and when that was achieved the expedition was over. Everything was

were, therefore, without incentive. 'I was frightfully lazy and very fat in my teens. My sister was always having to say to me, "Lay the table, Pat; do lay the table." Then I got very slim and nervy and just the reverse. I became frightfully keen to try at home, and to do the things I hated, like washing up and so on. I can only put it down to the religious motive, to make the best of things I hated. I was terribly keen to make a good show of it and do my very best. . . . I used to do them because it was good to do them, the fact that it was good and that it fulfilled my duty spurred me on. Now, I don't get the same promptings, and the things I don't want to do are harder to do. . . . Feelings don't enter into it now, just duty. I go to church regularly still, but I'm afraid there's a difference. I say "afraid" because I used to think it the most important thing in life, now I haven't any feeling about it. I just carry on in a cold sort of duty. No, it doesn't worry me, but I feel sometimes I ought to reform. I'm not able to say my prayers like I did. I'm very tolerant, you might put it that it's in a negative way, in a rather dull way. I don't suffer any agonies of shyness like I used to, because I just don't care now.' And her summing up was: 'Well, I'd rather be the way I was. But not for other people, it was so difficult for them. But it was better for oneself, because it was more interesting. Oh, yes, on practical grounds it's much better to be like this. If only I hadn't toppled over the edge it would have been all right, but when it led to the hospital, oh, it was horrible.'

It will be noted that she was still sensitively perceptive. Her conversation, too, was noteworthy in that it was not purely factual, but contained ideas. Indeed, she had remarked to her sister in a reflective moment, 'You know, I'm surprised that the Church countenances this operation.' Yet, despite her awareness of affective loss, emotion was returning to her, for 6 months after operation she had been unable to worry at all, 12 months after operation she worried unmistakably over certain events, 18 months after operation she had been for a time unable to sleep through other worries. Twenty months after operation she had a relapse, but this was into a manic state without noteworthy schizophrenic features. The right side was operated upon, again with haemorrhage. When seen 8 months after this completed bilateral operation she was again recovered. She was far less spontaneous and was more content. Her conversation had no hint of the ideational but was concerned solely with fact, except perhaps when, with a hint also of the fatuous, she reiterated that 'it was a wonderful operation.' She did not recall her previous estimate of herself, was surprised when reminded

of it, and said that she had now returned entirely to her pre-morbid normal and that, if the first operation had taken something from her, then the second had restored it. No doubt was felt, however, that in fact she had lost the insight that she previously had had. In the home she was wayward and hot-tempered in a fashion reminiscent of her adolescence; she had no insight into this and indeed showed no capacity for introspection at all. She appeared a much simpler and more automatic person. Her sensorial performance was the same as after the first operation except that she could no longer do simple subtractions of money in her head.

The other 4 cases recovered without subsequent relapse. All of them emerged from the immediate post-operative period free from distortions of content, except 1 who was euphoric and fatuous and believed for some months that the hospital was subjecting her to a memory test by repeatedly changing the names of the patients. All these patients were at home by 6 months after operation, though that is not to say that they were then well. One patient, for instance, though she had shown no abnormality in hospital, took no interest in her personal appearance, didn't bother about the state of the house, blamed other people for her own shortcomings, provided meals either very late or much too early, and laughed immoderately, even when her 3-year-old son burnt himself through her own negligence. But she improved steadily, and by 12 months no fault could be found with her as a parent or housekeeper, while socially her shrinking and inadequate personality was in some ways more satisfactory than it had ever been.

CASE 253, page 277. A housewife, though she managed the house all right, was less spontaneous and excitable than ever before, but she still became excited by frustration so that she had become markedly impatient, and developed an embarrassing habit of passing the time by singing if she were kept waiting in a queue. She ceased to do this within a year of operation, but she showed as lasting residua a certain simplicity and rigidity of mind: thus, if she went on an expedition it had to be with an avowed object, and once that object was achieved, she would return forthwith: if she decided to go out somewhere for tea, she would go and have tea, but she would not look at the shops, walk by the river, or enjoy any other diversion: if she went shopping it had to be with some special object, and when that was achieved the expedition was over. Everything was

done, therefore, with a set preconceived plan of simple kind, without elasticity or adjustments. The same simplicity was shown in other ways: she had a tendency towards repetitious conversation, the same response being evoked by similar stimuli, which was found to be irritating; she did her cooking in a simpler and more primitively stereotyped fashion than before; she was not resourceful in any sphere of activity, and her performance was generally, therefore, at a lower level. Withal this, she showed no symptoms or signs of schizophrenia, and she was considered to have recovered, though with some operative deficits.

Case 255, page 274, listless and apathetic at 6 months after operation, returned to his studies as apprentice to an estate agent. A year after operation he was alert, chatty, with impeccable behaviour. He could give an excellent account of himself, of his routine at work, and of his leisure hours. He was fully orientated, equable in mood, free from distortions of content, with insight into his illness. He could unhesitatingly retain 8 digits forwards and 7 backwards; he made no mistakes in serial subtraction of 7 from 100; he could recall the cowboy story complete with details, interpreted proverbs in appropriate terms, made no mistakes in rapid, if simple, subtractions of money in his head. He could correctly describe quite a complicated motor route out of the town, so that I later made the journey by his directions. The only abnormalities [illegible] the results in his correspondence course appeared no less good than before, his employer had reported to the parents that the patient, in the actual work situation, was more lethargic and showed less interest than before the operation: this even to the extent that he was unreliable, and that his future in this career would be settled by failure in the necessary examinations. The crucial evidence that might have been afforded by these last, however, was not forthcoming since the patient developed two epileptic fits with subsequent confusion, and owing to various difficulties of circumstance was admitted to a nursing home. It may be said that the patient, though a man with a university degree, had never been satisfactory in any work that he had undertaken, and that—despite his unsatisfactory post-operative record—he was none the less considered recovered from the illness. Though he has since done nothing, he has done it normally enough.

The remaining patient returned to lead the same unexacting

life as was led before, though here again it was extraordinary that so ineffably dull an existence could have offered any inducement to continue with it.

Conclusions

Thus, to sum up the results in these 19 cases with recurrent schizophrenic illnesses, we may say that there were no operative deaths, though 1 patient died later by accident; that 4 cases, all men, developed post-operative epilepsy though 1 had only a single attack; that 1 case was worse and 1 unimproved; that 1 case showed slight, and 3 cases marked, improvement of conduct; that 4 cases were discharged though not recovered, 2 of whom are working at the same level as before, while the fourth had never worked, and that 2 of those 4 were free from distortions of content and unrecovered only in that they showed phasic bouts of bad behaviour at home; that 4 cases recovered but relapsed; and that 4 cases recovered, without relapse, of whom 2 are satisfactory housewives though 1 is less effective than before, 1 leads the same sheltered life that was her pre-morbid lot, and the last returned to his studies but was less efficient and with a future rendered doubtful both on that account and because of the development of epilepsy. In 2 cases the phasic quality of the illness disappeared, to leave a mildly but chronically psychotic person. One of these cases was pre-morbidly a schizoid obsessive personality whose meticulousness was in abeyance after operation, the other had a not abnormal previous personality but after 1 previous attack, had developed a second in which disturbed phases alternated with normal (or comparatively normal) phases so rapidly as to constitute one long 5-year illness.

Considering the case-material from another aspect, in an attempt to discern any broad trends that might be of prognostic value, it is noted that this small group consists of 11 women and 8 men. Only 1 man, as opposed to 7 women, fully recovered, but 4 of the women relapsed, and, on the other hand, 3 men, and only 1 woman, became well enough to be discharged though not entirely recovered. It does not appear that the sex of the patient is a factor here.

Nor does it appear that the number of attacks experienced by the patient is of much consequence, provided that there have been

remissions of good quality between, without deterioration. There were recoveries among patients who had had 2, 3, 4, 5, 6 or more attacks, and the relapse rate, small though the figures are, showed no difference in that respect.

Nor did it appear of consequence whether the patient was in an accessible and reasonable state or in a disturbed and psychotic one at the time of operation. One of the 2 patients who were reasonable at the time of operation was the only one who was worse after it, while the other showed a mild chronic form of disorder as opposed to an acute and phasic one.

What did appear to be of consequence, on the other hand, was the length of time that the attack had lasted. All the recovered patients, as well as the ones who recovered but relapsed, were in an attack of less than 2 years' duration. The next shortest attack was 4½ years, and the patient still retained his delusions, though he appeared then not to be forming new ones, a year after operation. The patient whose multiple attacks so nearly merged into each other as really to constitute a 5-year illness (and she had certainly been in hospital throughout that time except for a three week trial) was worse after operation; another whose attack had lasted 5 years was unimproved, and a third was only improved as regards wildly disordered behaviour. One patient whose attack had lasted more than 8 years was discharged through the special efforts of an exceptionally accommodating and loyal family, but she was the only case to have been ill for more than 5 years for whom such disposal was possible. In this form of schizophrenia, then, as well as in the others that we have been considering, it appears that there is a time factor that militates against recovery. The figures are not such as to enable us to reach any precise conclusion, but it looks as though here also there is a critical time which is reached at about 5 years, if not before. It is the fact that the male patients had, on the whole, been continuously ill for longer than the females in this group that imparts the fictitious appearance of a more favourable recovery rate among women.

All the cases except 1 belonged more to the catatonic form of schizophrenia than to any other: the exception more nearly resembled paraphrenia than catatonic schizophrenia. All cases except 3 had some marked affective colouring. None of these exceptional cases recovered, though the paraphrenic was dis-

charged, but all had been ill for 4 years or longer. Both on these grounds, and because of the smallness of the figures, it is not possible to draw any conclusions as to the prognosis in sub-types of the group. But 8 patients had a history which combined a sudden onset of illness with the development then, or subsequently, of stupors. Six of those 8 patients recovered, the seventh was well enough to be discharged, is free from distortions of content, but shows phasic disturbances of behaviour in his provocative home environment: the eighth was worse. That is to say, 6 of the 8 recovered patients had illnesses with definite onset and stupors (though there were not always stupors in each attack); the seventh recovered patient showed marked affective colouring in the directions both of elation and depression. The 4 cases who showed a sustained recovery without relapse had all had illnesses characterized by a sudden onset with the development of stupors.

None of the 3 patients with firmly fixed delusions became free from them.

With regard to previous personality, 5 cases were considered to have been within approximately normal limits; 2 recovered, a third was discharged, the fourth was markedly improved despite a third attack which had lasted for 9 years, the fifth became a chronic instead of a continually relapsing case with personality changes which rendered her worse. Nine cases were considered to have been schizoid personalities, in the sense that they showed introspectiveness, few social contacts, lack of warmth, and a tendency to withdraw from competition; 2 recovered, 2 recovered but relapsed, 3 were discharged though not recovered, 1 was improved in conduct and 1 remained unaltered. Three cases were vulnerable personalities, in the sense of being mercurial, specially sensitive to praise or blame, with warm attachments and sense of social obligation, but with special difficulties in the sex sphere; 2 recovered but relapsed, and the other would in all probability have recovered but was accidentally drowned. Two were considered to have been unstable personalities, in the sense of having been moody, wayward, impulsive, with incongruous elements; neither recovered, but both had been ill for more than 5 years.

The figures suggest, as far as they go, that here, too, there is

some correlation between the previous personality and the degree of recovery achieved.

With regard to the response to previous treatment in relation to the response to operation, 3 patients had had no special treatment, and a fourth had been rendered pyrexial by T.A.B. injections without effect. Of the other 15 patients, 2 had had both deep insulin and electroplexy, of whom 1 had responded favourably to both treatments, and recovered after operation, while the other had responded to electroplexy but not to deep insulin, and was worse after operation.

Then, 4 patients had had deep insulin but no electroplexy. Two responded well and 2 did not. The 2 who did not failed to recover after operation, but 1 showed marked improvement of conduct, though both had by then been ill for more than 5 years. The 2 who did respond well to deep insulin responded to operation, in one instance very favourably (though he was accidentally drowned before final assessment could be made), in the other instance by becoming mildly and chronically, instead of phasically, psychotic, but able to work. The remaining 9 patients had no special treatment other than electroplexy. Three failed to respond to it, of whom 1 recovered and the other 2 were well enough to be discharged after operation. Six responded well to electroplexy, of whom 4 recovered, the fifth recovered but relapsed, and the sixth showed marked improvement in conduct, though she had been ill for 15 years. The cases having had deep insulin are too few for assessment. But it would seem that in this group of cases with recurrent schizophrenia, there is some tendency for those who respond to electroplexy to respond favourably to operation.

In this group there were 11 cases whose attack had not lasted longer than 2 years at the time of operation, of whom 4 recovered, 4 recovered but relapsed, 2 were well enough to be discharged though not recovered, and the eleventh would in all probability have recovered but for accidental drowning. If we compare this result with that of the cases who had been ill for 2 years or less in the group of schizophrenic patients with marked affective colouring (but without history of previous attacks) we find that they were much the same. For, of schizophrenics with marked affective colouring there were also 11 cases who had been ill

for 2 years or less, of whom 6 recovered and a seventh recovered but relapsed. On the other hand, if we consider the purely schizophrenic cases (without marked affective colouring and without a history of previous attacks), it is found that there were 7 cases who had been ill for 2 years or less, of whom none recovered. The results of operation among the recurrent schizophrenic cases and the schizophrenic cases with affective colouring were therefore better than the results in the non-phasic and more purely schizophrenic cases who had been ill for a comparable length of time.

Summary

(1) Nineteen cases showed recurrent schizophrenic illnesses.

(2) There were no post-operative deaths, though 1 patient was accidentally drowned before final assessment was possible. He was very much improved.

(3) Eleven cases were women, 8 were men. There was no relation between sex and degree of recovery.

(4) These cases have been observed for between 24 and 35 months after operation. Those at home have been there, with 1 exception, for between 1 and 2 years.

(5) Post-operative epilepsy developed in 4 cases, all men, though 1 had only a single attack. This, together with the figures from the purely schizophrenic group, suggests that post-operative epilepsy is more likely to occur in schizophrenic men than in schizophrenic women.

(6) One case was worse after operation, and 1 was unimproved.

(7) One case showed slight and 3 cases showed marked post-operative improvement of conduct.

(8) Four cases became well enough for discharge, though not recovered, and were able to function at much the same level as before the illness.

(9) Four cases recovered but relapsed.

(10) Four cases recovered without subsequent relapse. Of these, 1 housewife had lower standards, and 1 student, always an unsatisfactory worker, was post-operatively less efficient. One was a satisfactory housewife. The other resumed a sheltered and unexacting life.

(11) In 2 cases the phasic quality of the illness gave place to a mild, chronic psychotic state, 1 of whom later became free from distortions of content.

(12) The number of attacks experienced did not appear to be of consequence so long as the remissions were of good quality.

(13) Whether the patient was operated on in an attack or in a remission seemed of no consequence to the outcome.

(14) The length of the attack appeared to be a crucial factor. The figures were not such as to enable any precise point to be decided on as the crucial time beyond which recovery was especially unlikely, but no patient continuously ill for more than 5 years recovered, and only 1 such was well enough to be discharged. All the recovered patients had been ill for less than 2 years.

(15) As with the purely schizophrenic cases and with the cases of schizophrenia with affective colouring, a history of definite onset with occurrence of stupors during the illness was of favourable prognostic significance.

(16) Firmly fixed delusions remained after operation.

(17) The figures, though too small for definite conclusions, tended to suggest that the better the previous personality the greater was the likelihood of post-operative improvement.

(18) The figures also tended to suggest, in contrast to the foregoing group of schizophrenic cases with affective colouring, that patients with recurrent forms of schizophrenia who respond well to electroplexy are likely to respond well to operation.

(19) The results in the recurrent schizophrenic cases are much the same as in the schizophrenic cases with affective colouring (but without history of previous attacks) who have been ill for a comparable period of time. Both groups yielded results better than those obtained in hebephrenic cases and paranoid cases without affective colouring and of a non-phasic kind.

(20) One case is described showing slow improvement after operation, followed by some degree of relapse probably attributable to exposure to a situation evocative of conflict, which yielded to treatment by electroplexy resulting in something near recovery.

(21) One patient, subjected to unilateral operation only, showed an awareness of and sensitiveness to post-operative personality change sufficiently unusual to be worth attention. She later relapsed and recovered after operation on the other hemisphere, but had lost in self-awareness. (CASE 251, page 293.)

PRESERVED PARANOID SCHIZOPHRENIC CASES

THERE was a small group of 8 patients, all unmistakably schizophrenic in the sense that Meyer (1938) has described as 'having a fundamental twist foreign to average mature waking life . . . with projection.' They are grouped together because they all have something in common with each other, while they are distinct from any of the foregoing cases. They were all severely persecuted people, but well preserved in the sense that they showed formally correct conduct and grasp, were in touch with their surroundings, and could express themselves with fine shades of meaning in sustained conversation. Yet, it would be misleading to describe these patients as paraphrenic, for that term is usually taken to denote an insidiously progressive development of delusional systems in persons approaching or beyond middle life. One of these cases, even after a 4-year illness, was only 27, and in 3 instances the illnesses culminating in these preserved paranoid states had been stormy interludes from which it had seemed unlikely that the patients would emerge to their more or less formally correct pre-operative level.

CASE 263. Thus, the man of 27 said, 'I was in Haifa when this present trouble began. As soon as I felt it I began to know there was something wrong. I got queer ideas that someone in the company sort of knew me, or knew my family, knew things about me personally and yet I didn't know him. I finally put it down to the O.C., and I went to him and as good as told him that if he didn't know me I'd better report sick, either he did, or if he didn't I was ill. It appeared to me that he'd expected this, and I was sent to hospital. . . . Yes, I was discharged home. I claimed my job back and worked for 3 weeks, found the strain a bit difficult, didn't feel like myself. I went on the sick list and tried to explain things to my doctor. I didn't get any satisfaction, I seemed to be put off like, so I wrote it down in a letter to my doctor, and said if he couldn't explain these little worries he had better get me some treatment, so he recommended me to this hospital.' His gradually decreasing insight was shown by, 'Since then I've learned a few things and I'm

more convinced. I really knew then, but I'm convinced now.'

no outlet for it, no way of expressing it, it's a relief if it's only to think something bad. No, it's not very difficult to concentrate; I can concentrate on books and I have done quite a lot of work at occupational therapy, making a little wheelbarrow and a table. It gives me a little pleasure in making something. I was a tradesman in the Army. . . .'

Of his hallucinations he said, 'Oh, the voices don't say anything that makes sense, sometimes it is something that is taken from my head and sent back to me in an abusive sort of way. It's the way it's said, the nagging way of it . . . what I hear doesn't make sense at all. I can't give you an example now. It's a lot of softness, lot of nonsense, a lot of giggling and things like that, it's just a mock. It appears to be done to make you miserable. No, I'm not miserable in myself; apart from that I don't feel miserable. I begin to wonder what I'm doing here; there's nothing the matter with me. This last 3 weeks it's been a lot better, just an occasional word or two, easily ignored, but sometimes it's impossible to ignore.' 'I've tried to form some theories about it. My thoughts are centred on what is the purpose of all this. The only thing that'll make sense out of it is that this is a treatment, but all this palaver is only abusing my life. . . . Well, yes, I am resentful about it, and I don't know why they've done it.' In hospital it was noted that he concealed his delusions nearly all the time, but occasionally they would overcome him, and then, though he never struck anyone, he might be threatening. A report that he had broken his father's arm in a struggle proved quite without foundation, but he had on one occasion struck his sister. Otherwise, though often tense and angry, he had held himself well in check. This sample of conversation, so different from those that have gone before, should suffice to show something of the patient's preservation.

Case 262. A plump, well-preserved woman of 61 was both suspicious and reluctant to go through her story again, but after a little the urge to talk about herself gained possession of her, and she rattled on about a persecution waged by her former doctor who had a machine by which he read her thoughts, picked up conversations in her house, and then broadcast them to the neighbourhood; he was

trying to turn her children against her, plotting against them, trying to embroil them with the police and thus to ruin them. She had been to see him in protest, and he had shown scandalous duplicity in affecting to know nothing about it. She acquired some publicity through her behaviour and no one knew what counter-campaign she would be starting next. Then he had organized her illegal detention in hospital. But she had one great ally (a famous politician) who, as a result of numerous letters from her, had run down to the country, even with the war at its height, had scotched the doctor's machine, and had had it declared illegal by Act of Parliament. But the doctor soon started it up again illegally. . . . The illness was of 2 years' duration.

Case 261. A very well-mannered woman of 57 gave an immensely long account of a psychosis of 20 years' duration during which she had been patiently looked after at home. She said that her husband (a most respectable druggist) had been hypnotizing her against her will for years, had given her what purported to be medicines but were abortifacients which he had himself made up, had tried to throw her off the back of a motor cycle to precipitate abortion, had tried to throttle her, and on one occasion had crept out of bed and substituted a policeman who had taken advantage of her in the dark. She was engaged to marry the Prince of Wales to unite the people with Royalty, and there were great machinations between the Catholics and the Freemasons, which were proceeding to some mysterious climax. Voices came to her, from orchestral music and running water, sometimes just out of the air, telling her of the future and of her husband's malfeasance.

Case 259. A 38-year-old homosexual man had caused a disturbance in a London boarding-house by making furious protests against his neighbour, whom he believed not only to circulate abuse by shouting it aloud all night, but to have organized a whispering campaign whereby the patient was pointed at and asked, by innuendo, to leave any places of entertainment which he visited, since he was thought to be an improper person. These auditory hallucinations were continual, but productive of relatively little disturbance in the patient, who had no insight whatever but could explain the situation in fullest detail with appropriate comments.

More disturbed than any of these was Case 260, a 48-year-old harassed but tidy man, who for 5 years had been brooding and distressed. He had all his life been concerned, in an intellectual way, over religious doubts. Experiences (including wounds) in the 1914–18 war had provided another main theme of conflict. A third

one was the fact that he was childless though married many years. These conflicts, usually beneath the surface, had not prevented him from being a jolly, sociable, optimistic, and popular man. They were reactivated by the very notion of the second world war. In an insidious way he became irritable and morose, distressed by news in the paper, worried by the world situation, strung up by long periods of waiting in his voluntary work as an observer. He began to feel that war was wrong, that he should not have participated in the previous one, that his pension was blood money, and that he was wicked to have drawn it. He was kept awake by his thoughts and by the traffic, much of which carried war materials. Huge vehicles passed within a few feet of his door, shaking the house and, owing to the gradient, often noisily changing gear almost opposite. He became obsessed with this, noted queer things about the vehicles such as that they bore names of people whom he once had known. Thus, they would bring his past life before him, and it was only a step from that to supposing that they were specially designed to do so. At this he became angry and would sometimes break out into a rage, smashing the china, threatening his wife, and once having an altercation with a lorry driver whom he stopped for questioning. He developed bizarre and complicated ideas of reference, which he tended to conceal. There was some morning-evening variation in this, and the delusional intensity altered with the mood, but the mood was unpredictable and was not sustained. The patient improved after 5 months in hospital, but was not recovered and was re-admitted after a month at home. At interview he was aggressively suspicious, trying to keep his temper but sometimes sarcastic and contemptuous, while always guarded. He would become restless and pace about the room, then would go outside. But his need for help would bring him back again and, after asking angry questions to establish the examiner's identity and credentials, he would embark on paranoid discussions in which he became much distressed. He felt that nothing was true or to be trusted, and that all the world he saw was a great façade established to deceive and vex him. At the end of the interview he was conciliatory and pleasant, shaking hands, hoping that no offence had been taken, saying he had had so much of doctors and knew so little what to make of them that he feared he was often rude.

The other 3 cases had been stormier.

CASE 258. A woman of 48, always highly strung, sensitive, given to morbid fears, jealousies, and feelings of inferiority, had become

insidiously and increasingly paranoid, especially since the age of 42. She had grounds for suspicion of her husband. 'I began to have outbursts of temper after I had the hysterectomy.' (At 43, for fibroids.) 'I fight my husband and children, those I'm most fond of. I'm erratic and unreliable. If I'm much alone I become poisonous, yet if I'm too much with people I become suspicious, once or twice I've been threatened with certification. I get tense and restless and unreasonable. There are times when I feel able to control myself, then suddenly it comes down on me like a black cloud, I become another person and say and do things I regret. Oh, nothing very terrible, past bitternesses well up and the festering sore of this affair keeps cropping up. It hurts my pride. I've been dominated and made to feel ridiculous all my life. . . . I can't go back to being deceived. . . .' She had a harassed, hunted expression: she was fidgety and restless: she felt obliged to sleep with the door open and the light on. She carried her suspiciousness so far as to weave total strangers into a delusional web, and to believe that in every food office there was a Russian who watched her. She had made two suicidal attempts, in one of which (after taking drugs) she had been found unconscious at the bottom of a lift-shaft.

Case 257. A woman of 43, entirely wrapped up in her husband whom she nursed through a long fatal illness, seemed unable to accept the fact of his death. She became mildly depressed, suspicious of other people, and insidiously became more psychotic until a frank catatonic state developed, with auditory hallucinations from heaven, adoption of strange fixed attitudes, with excitement and aggressive violence. She was admitted to hospital where she developed in addition hallucinations of smell, but where she showed gradual improvement. She was not fully well, for she was liable to be agitated and self-accusatory, with restlessness, but her behaviour was satisfactory and she was discharged. This was 12 months after her husband's death at which time the illness seems to have started. She remained better (though she is said still to have been suspicious, to have misconstrued people's actions, and to have been deluded that she was being robbed) until 2 years after her discharge from hospital (and 3 years from the onset of the illness), when she became very excited and over-talkative, accused people of robbing her house, and was almost incoherent in conversation. She was certified, and on admission to hospital was disorientated, manneristic, over-talkative, and restless, while her answers to questions were irrelevant and meaningless. Later, she became orientated and less excited, but she was suspicious, hostile, restless, resistive, and aggressive. She remained

a continual nursing problem, requiring seclusion, etc., for the next 6 months. She then improved very markedly with electroplexy, and was transferred to another hospital. Here she maintained her improved state, but was suspicious and evasive, demanding the attendance of the Chief Constable to explain her illegal detention, etc. She had multiple ideas of reference, finding both that the conversation of her associates and items broadcast on the wireless contained insinuations about her past. She was liable to be aggressive if thwarted, e.g. when her jewellery was removed for safe keeping, but she was otherwise decorous enough. Her delusions appeared now to be confined to the fact that important papers of her late husband's had been tampered with and stolen, that her family silver had been removed and replaced by replicas which were very slightly smaller, and that some organization was interested in preventing her from finding the true facts about these things. She looked after herself satisfactorily, could converse in general terms, read books, wrote letters, and kept in touch with current affairs. But she was touchy and liable to anger if she ever thought she was opposed. She had settled into this state for some months (though that is not to say that she might not have had some later catatonic outburst) when operation was decided upon, 4 years after the onset of the illness.

CASE 264. A Polish woman of 51, an 'underground' worker in the second world war, developed a sudden illness in 1947. She heard people conspiring to shoot her, believed someone intending her harm was in the house, and spent much time watching for (and sometimes accosting) suspects among passers-by. She began to have what she called 'auditions,' urging her to do some intelligence work, from an imaginary member of the secret service. She made various journeys to strange places to meet this man, and regarded them as part of her training in intelligence work. She would hail cars which she believed to be on secret missions. On one occasion she left the house by a rope of knotted sheets. Her thoughts ran also on love, and voices accused her of disreputable 'affairs.' In hospital she repeatedly tried to rush through the doors to meet fellow agents in obedience to imperious messages. She was unimproved by electroplexy. Four months after the onset of the illness she had settled into a suspicious but calmer state, was able to discuss her feelings with some detachment, worked in the hospital laundry, and could talk on current affairs. Two months after that she had ground parole, was gracious, co-operative, and friendly, though still feeling her mind to be read, her thoughts to be anticipated and then misrepresented. She heard

insidiously and increasingly paranoid, especially since the age of 42. She had grounds for suspicion of her husband. 'I began to have outbursts of temper after I had the hysterectomy.' (At 43, for fibroids.) 'I fight my husband and children, those I'm most fond of. I'm erratic and unreliable. If I'm much alone I become poisonous, yet if I'm too much with people I become suspicious, once or twice I've been threatened with certification. I get tense and restless and unreasonable. There are times when I feel able to control myself, then suddenly it comes down on me like a black cloud, I become another person and say and do things I regret. Oh, nothing very terrible, past bitternesses well up and the festering sore of this affair keeps cropping up. It hurts my pride. I've been dominated and made to feel ridiculous all my life. . . . I can't go back to being deceived. . . .' She had a harassed, hunted expression: she was fidgety and restless: she felt obliged to sleep with the door open and the light on. She carried her suspiciousness so far as to weave total strangers into a delusional web, and to believe that in every food office there was a Russian who watched her. She had made two suicidal attempts, in one of which (after taking drugs) she had been found unconscious at the bottom of a lift-shaft.

CASE 257. A woman of 43, entirely wrapped up in her husband whom she nursed through a long fatal illness, seemed unable to accept the fact of his death. She became mildly depressed, suspicious of other people, and insidiously became more psychotic until a frank catatonic state developed, with auditory hallucinations from heaven, adoption of strange fixed attitudes, with excitement and aggressive violence. She was admitted to hospital where she developed in addition hallucinations of smell, but where she showed gradual improvement. She was not fully well, for she was liable to be agitated and self-accusatory, with restlessness, but her behaviour was satisfactory and she was discharged. This was 12 months after her husband's death at which time the illness seems to have started. She remained better (though she is said still to have been suspicious, to have misconstrued people's actions, and to have been deluded that she was being robbed) until 2 years after her discharge from hospital (and 3 years from the onset of the illness), when she became very excited and over-talkative, accused people of robbing her house, and was almost incoherent in conversation. She was certified, and on admission to hospital was disorientated, manneristic, over-talkative, and restless, while her answers to questions were irrelevant and meaningless. Later, she became orientated and less excited, but she was suspicious, hostile, restless, resistive, and aggressive. She remained

delusions, but speaks of them so rarely that her daughter was surprised that, at interview, they were mentioned by the patient spontaneously; she has come to terms with the situation, stresses the fact that her enemies have after all succeeded in doing no harm, and does not anticipate that they will succeed. She wrote a letter of thanks to the Very Important Person whom she believed to have helped her in having the doctor's machine scotched, expressing non-committally her gratitude for services rendered. She received a personal reply, stating that he was delighted to have been of use. This has already become a family heirloom. (A subsequent letter evoked only a printed acknowledgement from the secretary.) No new delusions have arisen. The patient was, however, slower and less methodical than before operation, to an extent which made it doubtful how far she would be capable of running her own home without help. She was also careless in the use of oil lamps and stoves to an extent which had once or twice jeopardized the safety of the house. Two years after operation she was showing some initiative in deciding to find a place of her own to live, but she showed poor judgment in that she was quite indifferent to the price that was asked (and without guidance would have bought an establishment entirely unsuitable both as to size and cost), while at 63 she was talking blithely of going off for the first time in her life to get a job. The village, to which she was pre-operatively a stranger, regarded her, however, as an entirely normal person, so it may be seen that the degree of her recovery was considerable.

The other discharged patient (CASE 260, page 306) was operated on in 2 stages owing to some difficulty with the anaesthetic.

He remained preoccupied over the wickedness of war, with self blame; he inveighed against the traffic; he felt that his environment represented a huge plot to drive him, a sane man, mad; he was liable to be angry and resentful. At such times he developed bizarre ideas of reference. There was, however, much variation both from one day to another, and from morning to evening of the same day. In the evenings he could read the newspaper without concern; next morning many of those items would be fraught with some new and sinister significance. In the mornings he was irritable and gloomy; in the evenings he might say that his conduct had not been censurable after all, that perhaps he had been misjudging things. On good days he would be amiable, helpful, and interested: on bad days he would be morose, brooding, ruminatively looking up the word 'lunatic' in the dictionary, and would angrily accuse his wife of conspiring to have him 'put away.' The bad days outnumbered the good. None

voices accusing her of prostitution and of Communism, was distressed by them, but maintained a level of conduct and grasp that was formally correct. Operation was decided on after 7 months of illness.

This was the clinical material forming this little group of 8 patients, whom we have called preserved paranoid schizophrenics. It will be noted that the duration of the illnesses has been very variable: 1 case had been ill for 20 years, 2 cases for 5 years and another for 4½, 1 for 2 years, 1 for 10 months, while the remaining 2 had settled into such preserved paranoid states over a matter only of months after the subsidence of more stormy phases.

Results

(1) Recovery with relapse. Only 1 patient recovered, and he had relapsed completely within 6 months. This was the youngest patient (CASE 263, page 304), aged 27, with an illness of 4½ years' duration. He is said to have become entirely free from distortions of content and to have regained full insight into his pre-operative condition by the time of his discharge home 3 months after operation. When seen 6 months after operation, however, he had shown a progressive decline starting in the fifth post-operative month, when he had again become deluded, hallucinated, and subject to ideas of reference of a paranoid schizophrenic kind, directed now against the hospital. Re-admission became necessary, and he now remains the same at a distance of 2 years from operation.

(2) Social recoveries. Two patients improved sufficiently to remain out of hospital. These were CASES 262 and 260, the lady who believed that her former doctor was recording and broadcasting her thoughts and conversations by means of a machine, and the bitterly suspicious man of 48 who could trust no one and believed the traffic to be directed past his house to annoy him and to remind him of his past.

The former, CASE 262 (page 305), has post-operatively been the picture of beaming benevolence. She lives with her daughter, son-in-law, and grandchildren. She looks after her affairs, manages her money satisfactorily, goes away on holidays, makes excursions, shops, helps in the house, minds the children. She retains all her

illness followed the death of her husband to whom she had devoted herself entirely, and who had passed from a paranoid to a catatonic state and back again over a period of 4 years, retained all her delusions after operation but was not much interested by them, showed no anger or hostility, and accepted the hospital as a friendly rather than a tyrannical institution. She would have been well enough for discharge had there been a suitable environment, but it was not felt that she was fit to resume her solitary life as a widow fending for herself. A marked post-operative indolence had disappeared in 12 months, and she worked fairly diligently; every now and again she would pack her bag and say she was going home, but when they told her to wait awhile and unpacked her bag she did not mind at all; she did not worry, treated all things as of equal importance, and just as readily discussed the morals of war as the flavour of cough-drops. She was reduced in mental capacity, though not in a gross or obvious way, but she was enabled to tolerate her lot which she could not do before, and she led a life of contentment with various pleasures from which her determined hostility had previously debarred her. She had no insight at all.

(3) Unimproved cases.

The Polish lady, CASE 264 (page 309), who had had a 7-months paranoid schizophrenic illness involving secret service delusions, recovered perfect social preservation over a period of a month, with freedom from hallucinations and from new delusions but without insight into the past. The condition thereafter returned in full force, however, and the patient has remained at much the same level as before the operation, though far less excited than at the beginning of the illness.

The lady of 57, CASE 261 (page 306), who had been hypnotized by her husband for 20 years between being given abortifacients and being engaged to the Prince of Wales, was unchanged by operation, and has remained in the same state for 3 years.

(4) Post-operatively deteriorated cases.

The homosexual man of 38, CASE 259 (page 306), who had made a disturbance in a boarding-house through shouting back at the voices (so that at first, since he was known to be an actor, he was thought to be 'rehearsing a part, except that the language he used wouldn't have been passed by the Lord Chamberlain'), was not appreciably altered by operation, but over a period of 3 years became somewhat worse in insidious fashion, showing increasing anger and

the less, he was far easier to live with, far less suspicious, far better tempered on the whole, and while he had become less enterprising, less inclined to go out and with a preference for home, this was of benefit in that he was much less upset by that sheltered environment than when stimulated by venturing beyond it. It was remarkable, considering the patient's suspicious hostility before operation, how cordially he received and entertained one in his house; he was friendly and his social behaviour was excellent despite the fact that he regarded his removal to hospital as an offence, and the whole hospital environment to have been specially faked in order to deceive and to upset him. He had the second side done some 10 months later, and seen 6 months after that (18 months after the first operation) he was much better still. He was now equable, genial, and considerate, without moroseness, ill temper, or sarcasm. He was energetic, interested, and alert, read the papers without ideas of reference, had resumed reading books from the library and playing the piano, could talk on political subjects without rancour, played lawn-tennis, went on expeditions, enjoyed the cinema. He had, in fact, seen a film which treated of several generations of a family involved in successive wars. 'I was on pins,' said his wife. 'Before he'd have been very upset and would have brooded about it for days.' But now he did not mind in the least and never referred to it again. Likewise, he had suggested on Good Friday that they should see the magic lantern slides of religious pictures shown by the vicar in Holy Week. Efforts to dissuade him, lest he be harrowed by pictures of the crucifixion and have his old religious conflicts revived, were unsuccessful; in fact, the wife was harrowed but the patient was not. He was a more shallow person, worrying very little, but he was much happier and steadier, and he was able to enjoy things denied to him for years. He was punctilious and polite; he went several miles by bus on a wet night, for instance, to ensure that a letter to me would catch the right post. The village regarded him as quite normal. Yet he was not. He had moments of sudden gloom and preoccupation, lasting only a few minutes at a time, but striking by contrast: he did not, to those who knew him well, show a normal intensity of interest nor did he heed situations sufficiently to take a real grip of them, and his notions about the traffic and his ideas of reference remained, though he hardly ever referred to them nor allowed them to bother him. He was fully aware of his operations, but he denied that they had made any difference whatever, or that there had been any indication for them.

Another patient, CASE 257 (page 308), the woman of 43 whose

would have caused them difficulty in fending for themselves. Another patient, in similar case, could have been discharged had a similarly suitable environment been available. One case showed a transient improvement short of recovery but relapsed to her pre-operative level. Two cases were worse: in 1 an organic confusional state was added to the psychosis, contributed to both by operation and repeated electroplexy, while some improvement after an epileptic fit was followed by death from asphyxia in a further one; in the other case the illness later developed with increasing severity, seemingly independently of the operation.

To correlate these results with the types of illness shown by the patients is of little help.

Two cases (262 and 261) were straightforward paraphrenics, 1 of whom made a good social adjustment and the other of whom was improved.

One case showed a paraphrenic illness dominated by auditory hallucinations with secondary delusional formation. He was unimproved. (CASE 259.)

CASE 264 showed a paraphrenic illness with the addition at first of much restless excitement requiring restraint. She showed some improvement after operation but relapsed.

Two cases (260 and 258) were paraphrenic with marked depressive features: 1 made a good social adjustment, the other was worse, and later died.

CASE 257 showed an illness with paranoid, catatonic, and again paranoid phases. She made a good social adjustment, though still in hospital.

The remaining case (263) was a paranoid schizophrenic of 27, who made a post-operative recovery followed by full relapse.

In order to understand these results it is necessary to consider in relation to each other the type of illness, the post-operative outcome, and the pre-morbid personality.

Thus, there were 2 cases in which the illness seemed to strike essentially without obvious cause, so that it was at variance with the patient's previous personality, seemed inexplicable as a pure reaction to events, while the personality became involved in the psychotic structure comparatively little. CASE 262, the only patient considered to have had a pre-morbid personality within normal limits, had an illness of sudden onset in paraphrenic form.

indignation, with a loosening and inclusiveness of his delusional system as the hallucinations continued and became more numerous.

The lady of 48, CASE 258 (page 307) (who had shown an insidiously progressive paranoid reaction not entirely without grounds but unreasonably involving all sorts of strangers and with notions that there was a Russian who watched her in every food office), was rendered worse by operation. She was irritable, disorientated, confused, intolerant of noise, prone to attack any patient who would not keep quiet, and very violent. Added to her psychosis there was an organic confusional state with cortical irritation; this lasted for at least 6 months after operation. The patient was so violent that daily electroplexy was given her for some time. After 12 months she was less confused, was orientated for place and approximately for time, but misidentified people continually. She recognized the hospital as such, but said it was intended for occupation by tarts. She denied that she had had an operation but thought it probable that she had been ill, although she claimed a complete amnesia since her admission. She could retain 6 digits forwards (as against 8 before operation), could reverse only 3 (as against 7 before operation), could recall only 2 out of 6 items in a simple memory test (as against 5 out of 6 before operation), and failed to get any simple subtractions of money right (as against 3 right out of 3 before operation). It was thought probable that frequent and continued electroplexy, given to control impulsive violence, had contributed to her organic confusion and amnesia, as well as to her impaired sensorial performance. Twenty-three months after operation she was less liable to confusion, showed a slightly improved sensorial performance, but was still impulsively violent though in general less hostile and resentful; she then had an epileptic fit. Soon after this she began to mprove so that she could be taken out three times weekly by a nurse. In the twenty-fifth post-operative month she was found dead in bed. The finding at the inquest was that she had died of asphyxia as a result of a further epileptic fit.

Thus, in this little group of 8 cases there were no recoveries at the end of 2 years. One patient had shown a period of recovery but had relapsed within 6 months. Two patients had become well enough to live at large, and to be considered normal by those who did not know them well; but they lived in sheltered surroundings without working, and a certain lack of discrimination between the important and the unimportant (with consequently impaired judgment and an element of irresponsibility)

environment as he had always reacted and so his psychosis continued. He was unimproved by operation, and later became worse, seemingly as a result of progressive illness rather than as a result of operation.

The other 4 cases were patients in whom the illness, though seeming to strike from without, fell on a vulnerable personality. In each case the patient experienced a heightened sensitivity, and therefore those items in the personality on which the patient felt most sensitively became of prime importance; they became activated and dominant; then, through their prominence in the patient's mind, they became necessarily involved in the psychotic structure. So, although the illness did not seem to grow as directly out of the personality as in the 2 foregoing cases, yet the personality and the structure of the psychosis became intimately interwoven.

These were CASES 261, 264, 263 and 260. CASE 261, quietly psychotic for 20 years, being hypnotized by her husband and being engaged to the Prince of Wales, had always been sensitive and shy; she had been afraid of sex and guilty both at the thought and in the performance of sexual acts, yet hugging her feelings to herself and ruminating upon them. Out of these preoccupations, and at first confined to them, the psychotic themes were developed so that they became a part of her personality, and thence stemmed an insidiously developing delusional system. Yet, an able, pleasant person with social sense, she had been able to carry on with her life. She was virtually unchanged, after so long an illness, by operation. CASE 264 (who had shown a paraphrenic illness with the addition at first of much restless excitement) had always been abnormally emotional with a life of the richest affective colouring. Ably aggressive, she would respond to a challenge with all the voltage at her command. The illness was of sudden onset, seeming to strike her from without rather than to arise from her own conflicts. It began with a sense of uneasiness and over-awareness which became suspiciousness. Her tense war-time experiences as an underground patriot in Europe provided a matrix ready made for the rationalization of such affect. Her feelings about her country, its fate, and the role she herself had played were activated. When hallucinations developed later, they were readily fitted into the pattern. The patient responded

It was not disintegrating in its effect, and though she retained her old distortions of content after operation, she made a good social adjustment. CASE 257 showed an illness with paranoid, catatonic, and paranoid phases. She had always been a shallow person, setting high values on outward appearance, but making only superficial social contacts with little warmth except for an over-attachment to and over-dependence on her husband, whose death she could not withstand. The illness developed definitely, though gradually, from this outside event, and elements in her personality seemed to contribute little either to its development or to the manner of its expression. She also made a good social adjustment, and though still in hospital could have been discharged had a suitably sheltered environment been available.

Then there were by contrast 2 cases whose abnormal pre-morbid personalities contributed so much both towards the development and the continuation of the psychosis as to have been the major factors in its formation. CASE 258 had always been highly strung, over-sensitive, and over-reactive, touchy, with irritability, inferiority feelings, jealousy, and suspiciousness. These had already alienated her husband, whose infidelity was an insult to which the personality over-reacted in characteristic fashion, with exaggeration of these characteristics which then kept the psychosis going. There were depressive features, of irregular and erratic kind indicative of some disintegration, with impulsive suicidal attempts. These were unfavourable features, and the patient was not only unimproved, but was post-operatively worse through the addition of an organic confusional state. Despite the considerable clearance of this over a period of 2 years, the paraphrenic illness still persisted at the time of her death from asphyxia in an epileptic fit. CASE 259 showed a paraphrenic illness dominated by auditory hallucinations of an accusatory kind with secondary delusional formation to explain them. He was a pitiably inadequate, unstable homosexual, who had always been at odds with life, resentful, feeling himself despised and a failure, frustrated and disappointed, though often making a pathetically brave pretence that he did not care. Although the hallucinations were of sudden onset, they announced what he had for years been feeling; as he had no insight into their nature, he reacted to what he took to be the

The dominant ideas then fell into the background, and a good social adjustment became possible.

The lesson to be learned from these considerations would seem, therefore, to be that in this group the more the psychosis depends on fundamental attitudes of the personality and the more that it arises from them, the less good is the prognosis. In both cases where the personality played an indispensable part in the formation and development of the illness, the results were bad. In 1 of the 4 cases where the personality became an intimate part of the psychotic structure once the illness was established, the result was favourable; but there the abnormality of the personality had been a tendency to intellectual rumination; where the abnormalities had been more fundamental the results were unfavourable. In the 2 cases where the illness seemed to have struck from without, and to the form and development of which the personality seemed to have contributed little, the results were both favourable.

With regard to the onset, 3 cases showed an insidious and 5 cases showed a definite beginning of the illness. Of the 3 cases with insidious onset, only 1 showed marked improvement, and in that illness there were depressive components of favourable significance. Of the 5 cases with definite onset, 2 showed marked and sustained improvement, while another 2 showed an improvement that was marked though only temporary.

With regard to duration of symptoms, 1 case had been ill for 20 years and showed no change after operation; 4 cases had been ill for between 4 and 5 years, of whom only 2 showed improvement; 1 case had been ill for 2 years, and reached a good social adjustment; 2 cases were ill for less than a year, but neither showed sustained improvement.

No inferences could be drawn from response to electroplexy or deep insulin.

The conclusion is therefore reached that in preserved paranoid patients the prognosis depends more on the extent to which the previous personality has determined the shape and course of the illness than on such other factors as the duration, type of onset, and form which the illness has taken.

with spirit and determination to what she conceived to be secret service messages and instructions, in a situation which she felt to be fraught with danger. If her reaction to it was intense, so was the severity of the illness, and though its progress seemed to be halted by operation, its recurrence and her readiness to respond to it brought her back to her pre-operative state. CASE 263, a sensitive and emotional man with a poetic turn of diction, and almost certainly basically homosexual, was concerned over a lack of sexual prowess. Yet, there did not seem precipitating factors adequate to explain the extent of the illness and its massive form. Always previously regarded as an ordinary person, he developed rather suddenly a heightened self-consciousness and sensitiveness. The chief impact of this fell on that aspect of himself of which he was so sensitively and secretly aware, so that there followed ideas of reference and double meanings with veiled innuendo. Hallucinations along the same lines developed much later, and the whole seemed a process disease which had brought into prominence that personal abnormality which formed a theme in which the psychosis could express itself. Operation was followed apparently by full recovery, but also by full relapse.

CASE 260, a man of 48, had long tended to special preoccupation with three themes of thought: religious conflict, horror of war arising out of personal experience, and the fact that he was childless. He was liable at irregular intervals to ruminate on these in an intellectual way. The first two were powerfully activated by the second world war. He showed an increased sensitiveness with irritability, intense preoccupation with his thoughts, the formation of ideas of reference, and restless worrying. The illness showed also a depressive colouring in a diffuse way, with morning-evening variation both before and after a unilateral operation. This ceased when the second side was later cut. His preoccupations were at an intellectual level, and apart from their special activation by outside circumstances and apart from illness, they did not profoundly disturb him at all; but when the illness was established, they provided generous material for psychotic elaboration. Though a vulnerable personality, he was not a bad one. The operation reduced his ruminative tendency and removed his depression of mood.

OTHER SCHIZOPHRENIC CASES

We have so far considered 4 groups of schizophrenic cases, and every patient in them was unmistakably within the schizophrenic range. We come now, however, to a group of 20 cases who were not unmistakably schizophrenic in that full sense of the term in which we have been using it. They were all considered to have fallen within the schizophrenic range in fact, but some contained anomalous features, and others lacked characteristic ones. Every one of them had been considered schizophrenic by some one or other of the physicians who looked after them, but there had not necessarily been unanimity of opinion, nor was schizophrenia invariably the diagnosis given to the operating surgeon. In this group, therefore, we are dealing with cases whose illness has not declared itself in the same unmistakable way as in the previous cases.

Essentially Schizophrenic Cases

There were nevertheless in this group 9 cases who were considered to be straightforwardly schizophrenic when the whole picture was taken into account. They could not have been diagnosed thus with certainty either by mere observation or in all cases by mere interview, but a combination of both coupled with knowledge of the history and background of the case pointed to a diagnosis of schizophrenia beyond any reasonable doubt. These 9 patients did not appear to be the victims of schizophrenia as an inexorable process disease submerging the whole personality under its onset; nor, although some showed marked fluctuations, did they appear periodic cases in the sense of showing clear-cut psychotic episodes with restoration to normality or near normality between. There was one exception: a patient was operated on during a remission from a catatonic phase of $1\frac{1}{2}$ years' duration, and during that remission he appeared to be within normal limits: but he cannot be included among the group of recurrent cases, for that first attack has so far been the only one. Apart from that one case, there was about the illnesses of these 9 patients

SUMMARY

(1) There were 8 patients who were considered to be cases of paranoid schizophrenia with good preservation.

(2) Two of these were classically paraphrenic, 3 were paraphrenic with admixtures of excitement or depression, 1 was paraphrenic but dominated by auditory hallucinations with the psychosis secondary to those, 1 had had a catatonic episode between paranoid phases, and 1 was a paranoid schizophrenic of 27 with good preservation despite an illness of more than 4 years.

(3) No patient made a sustained recovery.

(4) Two became sufficiently well adjusted to be discharged and to live in sheltered circumstances. A third reached much the same stage, but was without suitable environment outside hospital.

(5) None of those 3 patients were considered well enough to fend for themselves.

(6) One patient recovered but relapsed fully within 6 months; 1 patient improved but relapsed fully within 6 months.

(7) One patient remained unchanged.

(8) Two patients were worse, 1 through the addition of an organic confusional state, followed by two epileptic attacks in the second of which she died; the other was worse seemingly independently of operation.

(9) No prognostic inferences could be drawn from the type of illness or its duration.

(10) No prognostic inferences could be drawn from response to previous treatment.

(11) There was some tendency for greater improvement in cases with definite as opposed to insidious onset, but this was not necessarily sustained.

(12) The crucial factor seemed to be the extent to which the previous personality had determined the illness: the more intimately the two were connected the less good was the outcome.

vague feeling that people were against her and her family, which she recognized to be irrational: and occasionally she had felt that 'people might be talking about me, saying nasty things, saying I was a burden, but I think that was imagination.' She had developed also some obsessional traits, not previously in evidence, over the year or two before operation. She was not restless, fidgety, or anxious; it was most difficult to stir her up. She led a routine and automatic life. She ate well, slept well, menstruated regularly (though a period of amenorrhoea had ceased after treatment with cardiazol), tested her urine and gave herself insulin for her diabetes. Her extreme lack of interest, with insight into it, contrasted strangely with her eager, though over-serious, pre-morbid personality. The family history was negative, except that a maternal second cousin had been admitted to a mental hospital following a severe head injury.

The long duration of this condition, its persistence in so young a patient, and its absence of variation other than a slightly increased intensity, with its failure to respond to cardiazol, all suggest that we are not here dealing with a simple depressive state.

Post-operatively the unreality feelings persisted unchanged, but the patient worried about them less, was more cheerful and more sociable. The gain, however, was small, and there was the marked disadvantage that she had now, for the first time, frequent epileptic fits. She was also restless, less thoughtful and dependable, tended to leave her domestic chores unfinished, and was not considered by her family sufficiently reliable to hold a job, even had her post-operative epilepsy allowed. Further developments, not considered attributable to the operation but considered indicative of a very gradually advancing schizophrenia, were frequent extreme slowness in answering a question, stopping in the middle of the answer and then resuming after a pause, grimacing, and involuntary frowning. When asked the reason for her hesitancy in speech, the patient said that she was not preoccupied (though she looked it), but 'it's as though the answer is lost in the depths, and I've got to wait for it to come to the surface.'

She had had 6 fits in the first 6 months after operation, and 7 in the second 6 months, after which they were controlled by medication to the extent that in the third 6 months she had only 2. But this development, together with the small degree of post-operative improvement followed by what appeared to be slight but progressive schizophrenic changes, renders it doubtful as to whether the patient should be labelled 'unimproved' or 'worse.'

a chronicity with an absence of any sustained tendency towards worsening or towards improvement, while at the same time the degree of disturbance that they showed was neither as widespread nor severe as in the cases that we have previously considered. Thus, these 9 patients were all capable of sustained and relevant conversation in quite an elaborate way. They all recognized that they were ill, and that they were in hospital to get better, and they were appreciative of help towards that end.

Two of these cases had been showing psychotic features for more than 5 years, but the other 7 had been ill, on average, only for about 2½ years each. The duration of illness was thus, on average, less than in the other schizophrenic groups. But it did not seem that this alone determined the comparative preservation of these 9 patients, for comparing them individually with cases from our first 2 schizophrenic groups who had been ill for a comparable length of time, there was in this present group not only less deterioration, but there was less psychotic content and less fixity of it, less disturbance of behaviour, better retention of touch with the surroundings, and less submergence beneath the psychotic deluge. Two of these cases, for instance, had never been in a mental hospital, though 1 had been ill for more than 5 years, and the other had shown psychotic features for more than 10 years.

Thus, CASE 276, a diabetic girl of 24, had had an insidious development of unreality feelings between the ages of 19 and 20. 'I'm not living in this world at all,' she said, 'everything is unreal to me. I've felt the same way for about 5 years now, nothing seems normal. I don't feel the same. I can't really explain, but it's not living. I do

I

or

ce

become annoyed by her positive inability to feel any different, and in a spasm of rage against her lot had broken some crockery when a tactless remark about her illness had been made by her brother. She said that this tendency to vexation was the only vestige of feeling left to her. Though she had cried a good deal during the illness at one time and another, and had 3 times taken an overdose of pills with suicidal intent, she denied that she felt sad, saying, 'I feel more dead.' She said that she 'saw no point in going on' if she could not be helped to recovery. She had no distortions of content beyond a

ness had returned, his personal habits had deteriorated with disappearance of his narcissism, he was indifferent to his future, and heedless of the present. Only the smell had disappeared from the time of the operation onwards. Otherwise the condition had been progressive and the patient was said to be worse. But when finally seen he was thoroughly co-operative and accessible, free from distortions of content, realistic in thinking, far more confident and less self-conscious. There were remnants of his former state in his belief that he had given off unsavoury smells, though he no longer continued to do so, in a touchiness with and suspiciousness of those he did not know, in an occasional slow fleeting smile of inappropriate kind, and in the erratic purposelessness of his life. He had casually taken many jobs and had thrown them up for inadequate reasons. He was outspokenly impatient of authority and officialdom, resentful that life did not yield more financial success, and regularly and cheerfully drank too much when he could afford it. He had been jailed for six months for joy-riding on someone else's motor cycle on one such occasion. He thus represented a considerable social problem which was not rendered easier by his being far more master of himself than when tormented by his symptoms as before. But in a purely clinical sense he was improved.

The third case, a boy of 16½, had undergone a marked personality change, with introversion, taciturnity, and moodiness at puberty, followed by a progressive failure both in academic and social adjustment at a public school. Threats of superannuation were followed by a sudden outburst of panic, with accusatory hallucinations, fears that people were after him to do him harm, and delusions that he was being poisoned. He was taken home, where he agitatedly threatened suicide, was still acutely frightened, and was removed thence to hospital, where he was by turns panicky and terrified or aggressively demanding. He refused to eat lest the food be poisoned, he showed much push of talk with distractibility, and stated he was afraid of going mad. He was improved after a course of deep insulin in that he became much calmer, no longer feared imminent death, showed normal pressure of talk, and looked after himself. But he remained moody, preoccupied with ideas of failure, restless, and lacking in any powers of settled application. Though sufficiently well to be discharged 'recovered,' he was erratic, loving and sulky by turns, haunted by his failure at school and repeatedly seeking reassurance about his future. He made no progress at home and was returned to hospital which he resented and where he became periodically unco-operative. In an effort to overcome his inferiority

CASE 280, an obsessional, and basically homosexual, man of 30 had had anxiety symptoms for many years. These were exacerbated by a motor accident in which he sustained concussion, and were continued as a reaction to his feelings of social insecurity. These last centred around his having been for 4 years repeatedly offended by a peculiar smell. He believed this to arise from himself, and he attributed it to some abnormality of the rectum which, he believed, caused sweat from his perineum to become offensive through faecal contamination. It may be said that no observer in the hospital ever detected this smell though the patient frequently declared it to be present. Nor had anyone ever challenged him about it directly, though he found continued insinuations, repeated oblique references to it, veiled slights, etc., wherever he went, usually from young women. As a result of this, he moved not only from his home town, but, when he found the situation the same wherever he went, he changed from job to job and from lodging to lodging, and, as he became a constant nuisance to the labour exchange, from one area to another. He became miserable, lonely, self-absorbed, hostile to society and suspicious of it. Apart from his olfactory hallucinations and his delusions, he had a long history of abnormal behaviour. From being a 'bright, sociable boy,' he became in adolescence solitary, moody, and erratic. He never kept a job; when his mother died and left him a little money, he dissipated £76 in 3 months on pleasure; when out of work, which was more often than not, he would lie in bed till 3 p.m.; he sponged on his relatives and refused to help in the house; he had for years felt that he was being watched and had been suspicious of the neighbours; he was dreamy; he was narcissistic, spending hours polishing his nails and looking at his reflection in mirrors; he had 2 prison convictions for larceny. At interview he was in excellent touch, gave a strictly edited account of himself with great fluency, and despite his olfactory hallucinations with delusions and ideas of reference secondary to them, he showed on the face of it excellent social preservation. He had been in various general hospitals without its being realized that he was psychotic at all. Post-operatively he again became a vagrant; although letters reached him he never replied to them and it was only with great difficulty and the co-operation of his relatives that he was finally run to earth in the North of England. He was reported to have become increasingly fatuous, giggling often to himself, increasingly narcissistic, happier, less suspicious, less broody and morose; by 12 months after operation it was reported that his giggling tendency had increased, his sulkiness and morose-

to pressure on the button. He said little spontaneously. He followed the routine and did not give trouble. He did not appear to mind his detention though he insisted that he was perfectly well. 'I don't like being locked in,' he would almost shout, 'though I quite realize the necessity of it. Well, I mean, it's obvious if you let these people out there'd be a lot of trouble. I don't think it's necessary for myself, I'd say that mentally I was perfectly fit.' When one of the doctors had disagreed with this view, the patient was quite unmoved. Eighteen months after operation he again returned home at the instigation of his relatives. More than 2 years after operation he was unemployed, too unreliable for employment, still assertive and uncouth, mannered, restless, too readily excited, and curiously wanting in effect. But he showed no distortions of content, and though not an ornament to the home, was an inmate who was tolerated. The operation had induced an alteration in his attitude which enabled him to make an adjustment to life outside a mental hospital.

Thus, of these 3 cases, the first, who on account of diabetes had not been given deep insulin therapy and who had been ill for 5 years, was unimproved by operation after which she had developed epilepsy. The second, who had shown psychotic features for 10 years or more, was relieved of his distress from olfactory hallucinations but otherwise was a social problem. The third, improved by deep insulin to a point far short of recovery, who had also shown psychotic features for 2 years before a sudden acute episode, was helped by operation to make an adjustment to the outside world, though disordered behaviour continued, and he had post-operative deficits in restraint which rendered his personality less attractive than his pre-morbid one. The remaining 6 cases did better, except for 1 who died.

A girl, aged 20, had had a sudden loss of consciousness at the age of 18. There are powerful reasons for supposing this to have been an epileptic manifestation. On admission to a general hospital 48 hours afterwards she complained of headache, drowsiness, and nausea, together with depression and feelings of guilt. She was considered recovered after 3 weeks, but at home a change in her was noted in that she had become depressed, uncommunicative, querulous, and forgetful, while she had had a bout of screaming, when she complained that nobody loved her and that she wanted to leave home. At a psychiatric out-patient department it was noted tersely

feelings he would be blustering and assertive: occasionally he would be sufficiently bad-tempered to assault fellow-patients, though he would always choose them carefully; the smallest difficulty, such as making a bad shot at snooker, would be enough to infuriate him. Twelve months after the onset of symptoms, and despite 2 courses of treatment by deep insulin, he remained in this state, poorly controlled, swaying between assertiveness and submissiveness, demanding at one time, begging for help at another, too distractible to gain any sense of achievement since he stuck at nothing, and chronically brooding on 3 topics: (1) his school failure and the impossibility of overcoming that handicap; (2) insanity; (3) the geographical location of heaven and hell, and the impossibility of integrating his own views with those of established religion. At interview he would discuss his problems readily, and could give a good account of himself though it was always edited to minimize any ground there might be for criticism, and he never looked the examiner in the eye.

After operation he lost these preoccupations entirely and worried over nothing. He was at first slow but, always restless, he later became more so, so that it was a great achievement to get him to sit through a game of draughts. He continually wanted something to do, but when given a job he would never stay at it for more than a few minutes. He was in many ways unrestrained: he would shout from the top of the house if he wanted anything; he would use bad language; he would issue commands rather than requests; he was liable to throw away as having outlived its usefulness anything that was, for example, slightly broken but still serviceable; he would go down into the town and visit his father's office 20 times in a morning and he never shut a door without slamming it. He was, in fact, much the same as before the operation except that he was no longer worried, brooding, or depressed; the erratic behaviour and lack of application persisted while the restlessness was *increased*; the assertiveness remained but in the absence of broody worrying it became chronic instead of intermittent. The patient's noisiness, excitability, restlessness, continual demands, unreliability, and frequent disappearances for many hours on his bicycle made him a source of anxiety in the home; while frequent clashes with his young sister, who would not put up with the domineering of her strange new brother, excited him to an alarming pitch. He was again returned to hospital to ease the domestic situation. When seen there he seemed quite devoid of emotion. He answered any question in a loud, automatic, staccato fashion, much as a fog-horn would respond

her from ever being on easy terms with people. While the content was thus mainly depressive, her grasp was defective, her sensorial powers poor for one of her ability and intelligence, her rapport fluctuated as she talked, and she showed mannerisms with grimacing. After operation the patient became much more fatalistic and accepting of her lot; she returned home without demur, where she stood up for herself, showed absence of timidity and of suspiciousness in her social relations, and singular placidity with absence of worry and some blunting of affect in the sense that she experienced joys, pleasures, and sorrows much less keenly than before. By 8 months after operation, or 2½ years after onset of illness, she was working in her old capacity as a teleprinter. She had, however, noteworthy intellectual deficits which are discussed elsewhere (page 53 f.), and she was dissatisfied with her work, wishing to become a librarian. She none the less put up with the position, and continued at work for 18 months, before deciding to train as a children's nurse.

As far as her schizophrenia is concerned, this patient must be considered to have recovered. But the value of the result is lessened by the intellectual changes which, though compatible with her fairly skilled occupation, constitute a considerable handicap.

A girl of 18, who had also become introspective, moody, obstinate, and uncommunicative from the age of 13 onwards, developed olfactory hallucinations with feelings of unreality, lack of interest, and ideas of reference. She had some depression and anxiety reactive to these, which later gave way to a hypomanic development in addition to the other symptoms. She became garrulous, inconsequent, and unkempt, but after a course of deep insulin became more controlled, though she was still inclined to giggle. After 20 months of illness she had become begrooved. She was dissatisfied with herself and her past, with her failure to find a satisfactory job, and irked by the added difficulty to future employment caused by her having been admitted to a mental hospital. She repeatedly said that she wanted some responsibility as an aid to pulling herself together, but she was quite unfit for this as she was woolly and unpractical, and liable to act on inadequate reasons which she would also use to excuse previous failures. She was unco-operative with the nursing staff, assertive, and awkward. The failure to improve further was considered an indication for operation, after which she became at first very indolent and slow. She adjusted to her home much better than before, however, and after a good deal of stimulation she became useful, sociable, equable in mood, and capable of enjoyment. She planned to enter the Land Army, but as there was

that she was dreamy with thought disorder and blocking, hallucinations, autochthonous ideas, and some depression of mood. She was recommended for admission, however, not to a mental hospital but to a neurosis centre. On arrival there she complained of feeling bewildered as a result of 'funny fears' such as that a man or a car would 'suddenly go for her,' and of the sudden involuntary intrusion into her mind of visual images, 'chairs or tables or buses, nothing particularly frightening,' with 'jumbling' effect. She looked puzzled and showed thought blocking. She was given deep insulin treatment. What seemed at first a promising response to this was not maintained, nor was the patient improved by electroplexy or thyreoid extract. The picture had in the meantime somewhat changed so that the hallucinations and autochthonous images had disappeared, and the patient was instead preoccupied with a morbid dislike of her home disproportionate to the facts. It was decided that she was too much of a suicidal risk and admission to a mental hospital was recommended, but the patient was then taken home against advice. She was diagnosed as 'hebephrenia.' After 2 months at home, and 14 months after the onset of illness, the patient went voluntarily to a mental hospital. She was given a course of electroplexy without obvious benefit, but later became on the whole better until any suggestion was raised that she might return home, when she was liable to be demonstrative and uncontrolled. She did, however, return home for a month during which she was pessimistic, asocial, and glum, sitting inert and apathetic for long periods of time. She returned to the hospital, where she again became demonstrative and uncontrolled at times, throwing herself about in an attempt to avoid electrical treatment, banging her head against the wall on occasion, and always agitated after visits from her parents. This behaviour, however, was considered essentially hysterical. At interview she was fully orientated, complained of a diffuse depression of mood, described previous auditory hallucinations but said that they now only occurred in relation to attacks which appeared certainly to be *petit mal*, was free from delusions and ideas of reference, but was preoccupied with what she felt to have been an unsatisfactory and disappointing past and a cheerless and uninviting future. She felt that she had not been a success at work and had nothing to look forward to; that she had been unhappy at home and expected to remain so; that she had been thwarted in love and would continue to be frustrated; that she was handicapped by her physique, her home, her upbringing, and past events (including a seduction) which had inculcated an attitude of suspiciousness and misgiving which prevented

compulsive movements, feeling that she must violently move her head and limbs, dig her fingers into her hands, wrench her arms from one position to another, shoot her tongue in and out, kick her legs, and jump into the air. She became exceedingly impatient that she was not cured, stressed the hereditary nature of her complaints, and asked for a leucotomy to be performed. 'This ridiculous illness,' she said, 'is the climax.' She was very tense and unsettled. Over the 2 years since operation, she appeared superficially normal at any interview. She was certainly free from distortions of content, and she showed no behaviour of obviously schizophrenic kind. As far as schizophrenia was concerned she was considered to have recovered. But she was liable to irritability in the home to an unbearable extent, choosing one member of the family at a time as the target. She was slatternly and inefficient as a housekeeper. She was greedy and shamelessly selfish over eating rationed foods, and her increase of weight was fantastic. At various jobs which she undertook she was erratic and inefficient, without insight into her shortcomings. She showed intellectual changes of Goldstein's type which are discussed elsewhere (see page 65). She was perfectly able to live outside hospital, and to look after herself in a muddled way, but she was not employable, and despite a post-operative inertia which was to some extent persistent and which had replaced her impetuosity, she retained many of her pre-morbid psychopathic traits.

A woman of 49, of quiet and retiring disposition, easily dejected by small difficulties, unconfident and always indecisive, yet had a certain waywardness prompted by a latent aggression which would make an unexpected appearance now and again. She, too, had contracted a disastrous first marriage, and later a second, which, though in some ways satisfactory, was unromantically dull. As a distraction from this latter she had a mild 'affair,' as a result of which she became moody and irritable. She took unreasonable dislikes to people, felt that they looked at her in a way that had some vaguely sexual meaning, was suspicious of their thoughts and intentions. She lost interest in her housekeeping duties with which she could not cope. She worried a great deal, with indecisiveness, capriciousness, sexual preoccupations, and an increase of libido despite depression of mood and anxious gloom. Then she developed hallucinations of animals, mainly rats and snakes, which were very vivid, and which terrified her; she also saw disembodied heads on the hearth rug, and several times had the hallucination of a man, whom she did not know, stepping out of a car outside the house. She

no actual necessity to work, she took the opportunity which offered of travelling abroad, and for the last 18 months has been leading a normal and active social life in Italy. She is a slightly empty person, no longer given to philosophic rumination and lacking in freshness of ideas, but she is stable and sensible and has been able to learn Italian. She could not be classified other than as 'recovered.'

The next 2 cases are noteworthy in that they reached a much improved level after treatment with deep insulin, though they were far short of recovery. After operation they both became free from symptoms.

A woman of 41 with a history of lifelong instability, in the sense of being impatient, impulsive, irritable, intolerant of frustration, and volatile, closely resembled her father of whom she said, 'He's spent all his life in the train, he's terribly restless, always banging his fist on the table, and having law-suits and insulting people. . . .' She impatiently contracted an imprudent marriage with disastrous results. Numerous neurotic symptoms followed: palpitations, sweating, crying spells, intolerance of noise or crowds, and multiple [illegible] without organic basis. At 39, after having been long [illegible] much sexual preoccupa- [illegible] ticized by others on [illegible] numerous ideas of reference. [illegible] er and were against her. After 6 months of this she [illegible] pressed and excited, tearful and apprehensive; she had bizarre somatic symptoms; she heard accusatory voices criticizing her. On admission to hospital she was fearful but aggressive, accusing other people of insulting her, with noisy outbursts in which she would smash windows. 'I was completely mad,' she said later, 'I was going to send for the Queen and tell her I didn't like it there.' After a month she discharged herself and was admitted to another hospital, where she had haptic hallucinations of an erotogenic grease being applied to her genitalia, and a combined compulsive-hallucinatory experience of having to pronounce the name of a person with whom she had been in love and then hearing him laugh, in addition to her other symptoms. [illegible] by deep insulin was followed by great improvement, [illegible] delusions, and ideas of reference, [illegible] prehensive excitement by a disinterested inertia, with [illegible] o the illness. 'I've thrown everything away,' she said, 'through wilfulness and something in my character which I can't control.' But she then began to develop

noted was that he did not at first pursue his work with quite the same vigour as he had formerly shown. Two years after operation he was considered by his relatives normal in all respects. It is to be noted, however, that he still showed a noticeable lack of interest in women, and that his occupation was that of agricultural labourer; the former indicates that he was restored only to his own pre-morbid normal, and the latter is not such an exacting occupation as to bring to notice minor deficits that may exist.

The last of the cases found to be schizophrenic on full consideration, though not obviously so at sight, need not detain us. He died 10 days after operation. The cause was a pulmonary embolus arising from thrombosed haemorrhoidal veins. During this short post-operative period he seemed much improved.

We may briefly summarize the results in this small sub-group of 9 essentially schizophrenic cases by saying that:

One patient died of causes to which the operation might have indirectly contributed.

In 1 case the illness appeared to be progressive despite operation, but the history was of more than 5 years' duration.

In 2 cases the illness did not appear to be post-operatively progressive, but there were still persistent symptoms which remained after operation though in altered form.

The other 5 cases became free from schizophrenic manifestations, and have remained so over periods of approximately 2 years during which they have resumed their previous lives with small modifications. Of these 5, 1 had entered a spontaneous remission before operation, 1 had spontaneously entered a phase of marked improvement arrested far short of recovery, 2 had been much improved after deep insulin but had numerous residual symptoms, while the last had minimal—though definite—schizophrenic features with a hysterical overlay.

Thus, 5 out of the 9 patients actually recovered, so that 2 resumed their former employment satisfactorily, 1 became an erratic worker as she had been before, but was now less efficient, and 2 resumed the leisured lives of people of independent means.

The other 4 patients, though 2 of them were unimproved or worse in all respects except that they tolerated their symptoms more easily, were all able post-operatively to live at home, though

became increasingly vague, with ill-directed activity. She fluctuated a good deal over a period of 4 years, sometimes in hospitals, sometimes living in hotels. A course of deep insulin was followed by striking improvement, in that her mood became equable, she gained insight, and the visual hallucinations became less vivid and were infrequent. She was, however, very vague, unconfident, and inconsequential in her conversation. She would have been unable, owing to vagueness and indecisiveness, to run a house, while an anticipatory anxiety of meeting snakes and rats prevented her from outside activities. After operation she was at first markedly anergic, but within 6 months she had become active, undertook expeditions, flew to places abroad, thoroughly enjoyed herself: was free from hallucinations, disturbances of mood, ideas of reference, and though indecisive as always about her future and her plans, she coped excellently with the immediate present. Closer observation, however, showed that she was shallow, almost euphoric, that her bright chattiness was trivial and boring, with a failure of discrimination that amounted to fatuousness. She was extravagant, slightly too free in conversation, and in general lacking both in affect and in restraint. She was not at all disturbed when her second husband died, and she said of the illness, 'It was on the 13th. It always was an unlucky day for me, and it was such bad luck on him, poor dear, he'd had all his teeth out only a short while before.' Such a remark might arouse no comment when coming from an uneducated person; but the patient was a highly cultivated woman and was speaking of a husband who had shown her great devotion. Apart, however, from the casual appearance, 22 months after operation, of 2 crocodiles in her bedroom, she has remained for more than 2 years free from any manifestations that could be ascribed to schizophrenia.

Of the cases considered to have been straightforwardly schizophrenic, though not obviously so at sight, there remain 2 more.

One, a man of 27, was operated on while in a remission from a typical catatonic episode. The psychosis had lasted 18 months, had had an abrupt onset, and had been marked by stuporose phases; it had resolved gradually over a period of months. When seen before operation, the patient showed no abnormality beyond a certain shyness which was not considered pathological. His relatives considered him restored to normal. His recovery from operation was without incident. The only change in personality that was

periods of excitement alternating with resistive stupors in which she was incontinent; in aggressive outbursts she declared that she had become one of the beasts and that the apple trees in the garden menaced and mocked her. Both were treated with electroplexy about 18 months after onset of the original symptoms, and both showed transient improvement but relapsed. Persistence with the treatment in CASE 278 brought the patient to a pitch where, though still hypochondriacal, she was no longer disturbed by the apple trees, etc., and was felt well enough to be discharged, but 3 days later she made a suicidal attempt by drinking creosote and the next day fractured her spine by jumping from an upper window. Both of these were sudden and impulsive acts. She was returned to hospital with olfactory hallucinations, and remained stuporose for 8 months until she gradually emerged into an apathetic state in which she mistook identities, believed strangers were related to her, refused to believe the hospital was a hospital, was suspicious and bewildered, and believed that the newspapers and the radio relayed information specially designed to remind her of unpleasant things. While the content was thus depressive, she was detached, with affective incongruity in that she laughed brightly and smiled, was evasive, would stop studdenly in what she was saying for no apparent reason, and within the course of a few minutes would show marked spontaneity followed by sudden withdrawal of rapport. After 3 months in this state without signs of improvement she was operated on, nearly 4 years from the original onset of symptoms. CASE 277 in the meantime had become increasingly inaccessible, but emerged from stupors to declare that his heart had been removed from his body, as had his soul, and that his corpse was rotting, while he believed that he was Christ, the King, and the doctor all at the same time. Auditory hallucinations bade him to cast off his clothes and climb to heaven; the nature of the visual hallucinations which appeared to be present was never established. He was operated on in a very emaciated state just over 3 years from the original onset of symptoms.

As to the results in these 2 cases, both patients ultimately lost all their symptoms and resumed an active life outside hospital, but their course of recovery was quite different.

CASE 278, who had shown the florid symptoms earlier in the

pre-operatively they had been in hospital either continuously or repeatedly.

As regards personality changes, of the 5 recovered patients 1 was not detectably altered, 2 were in some ways better than they had ever been, though 1 of those 2 had intellectual deficits; 1 became more trivial and shallow (specially noticeable through her being a woman of education and culture) but better adjusted on the whole, and the last was erratic and tiresome as before, though in different ways and with reduced efficiency.

Mixed Cases of Schizophrenia with Depression

Next, we come to another small sub-group of 8 cases all of whom showed illnesses in which depression of mood was a *clamant* feature. Yet these were not straightforwardly depressive illnesses. More than that, they were illnesses in which bizarre features were so obtrusive, formed so important a part of the nursing problem, and so ominously interfered with recovery, that it is felt that these conditions must be regarded as schizophrenic with depressive features rather than depressive with schizophrenic features.

Two of these cases began with appearances of involutional melancholia, but while it is true, as Hoch and MacCurdy pointed out, that this condition (in so far as it may be a clinical entity at all) may be classified in 2 forms, that more akin to the depressions of manic-depressive psychosis, and that more akin to schizophrenia, the illnesses in these 2 cases became ultimately so schizophrenic in type as to raise the question of identity rather than of kinship.

Both were patients over 40, and in both the condition started with much hypochondriacal concern, in the one case over 'rheumatism,' in the other over soreness of the throat. Both attributed a general lowering of vitality to physical causes. In each case there was a year of persistent worrying over health, with accompanying restriction of activity, before severe depression of mood declared itself in frank form. Case 277 then became agitated, importunate, with hysterical outbursts associated with the most bizarre hypochondriacal notions. Case 278 developed

apparatus for wireless transmission and reception on which he had long been an expert. It was evident, however, that people with whom he formerly played bridge now avoided him as a partner, and on testing he could retain only 6 digits forwards and 4 backwards, could recall only 4 out of 6 items in the name, address, and flower test, got 2 simple subtraction sums wrong out of 3 when he did them in his head though he got them right on paper, and was unable to retain enough of the cowboy story to retail it. At the end of 2 years, however, he could retain 8 digits forwards and reverse 7, and could calculate small change quite correctly in his head, while his other sensorial performances were also good. His wife found no personality change in him beyond the fact that he was a little less attentive to her and was inclined to seek his own pleasure and comfort with slightly less thought for hers.

Then there were 6 cases, also all depressed, but whose illnesses were so highly coloured by schizophrenic features as to remove them beyond the bounds of ordinary affective disorders, while the marked fluctuations, with frequent periods of full accessibility with preservation of personality, reasonableness, and rapport, were such as to remove them from the category of full-blown schizophrenia. All the cases were under 40, all had made suicidal attempts, all acted impulsively, all showed violence, and all had a predominantly depressive content. All were perplexed and preoccupied by bizarre thoughts, and all were introspective and analytical. CASE 269, for long tormented by accusatory hallucinations, believed herself responsible for the atom bomb, was convinced that because she had lost her identity card she had lost her identity, and felt herself to be personally identical not only with every character of whom she read in books, but with all murderers and robbers since the beginning of time; in the same way, she was the atom bomb itself, and she was quite unable to determine where her identity began and ended; she was the only woman in the world who menstruated and she felt that she should not; she was pursued everywhere by the number 9, as with some monstrous accusation, and she read it into everything she did and saw; she felt that her breakdown was responsible for the state of the world and for everything that occurred in it.

Another patient, whose illness had started with a simple

illness (with stupors and aggressive outbursts, followed by suicidal attempts, olfactory hallucinations, and prolonged stupor which ended in an apathetic state with depressive content but with affective incongruity and unpredictable fluctuations in rapport), lost all distortions of content very soon after operation to become placid, negligent, fatuous, and lacking in interest. This was followed by a hypomanic phase, with restlessness, gusty laughter and giggling, great push of talk with immodesty, but without delusions, which lasted for some 10 months. Two years and 3 months after the operation she was able to leave hospital and to look after herself. She was very slightly euphoric, active, and diligent without being overly so, in touch with current events, thoughtful for others, and a pleasant personality; she was not, however, a reflective or retiring person, and her company was slightly boisterous without being stimulating; there was a hint of fatuousness, her sensorial performance was reduced slightly, and she conveyed the distinct impression that, while effective in action over simple matters, she would fail, and fail without insight, in any complicated enterprise, though such would have been within her grasp before the illness.

CASE 277, who had shown the florid symptoms late in the illness, which ended in profound stupor with incontinence, after periodic stupors interrupted by responses to auditory hallucinations and agitation over an increasingly bizarre hypochondriasis, gained full rapport at once after operation, was physically much improved, was no longer hypochondriacal or depressed, but retained distortions of content for more than 6 months. Auditory hallucinations made disjointed remarks: 'Won't you have another snack?' 'Waltz with Ida now.' He believed that advertisements were inserted in papers with a view to influencing him specifically, that other patients influenced him as part of the treatment and in a fashion which was determined by what they had had to eat, that medicines changed colour when they were carried past a particular screen, etc. His behaviour, however, was beyond reproach. On return home he rapidly lost all delusions and ideas of reference. At the end of a year he had very occasional and faint auditory hallucinations of an unmeaningful kind. He had resumed his work as a company director, had taken up his social life, and had reassembled in a new place a highly complex and elaborate

All 6 cases lost their symptoms, became free from distortions of content, and returned home within a year; all but 1 returned home, in fact, within a few months of operation.

CASE 269 within a few months was earning more than £1,000 a year (a large salary for a woman), in work which was creative within a commercial framework; namely, the direction and designing of advertisements. At first she worked with less enthusiasm and with a flow of ideas less rapid than pre-operatively, but within a year she said that her work and her attitude towards it was as good as it had ever been, and there was no evidence to the contrary. CASE 272 was a housewife with 2 children to look after: domestic friction of some standing became complicated by a post-operative outspokenness and impulsiveness, but there were faults on both sides: within a year the household had settled down to the pre-morbid level. A third worked steadily though her job was uncongenial. A fourth (CASE 275, always a psychopathic personality in the sense of being moody, lacking in identifications, snatching her pleasures wherever she could with repeated infidelities to her husband, living always on a short-term policy, unsettled and unsatisfied) resumed married life, but the old discords evoked from her such intolerant reactions as to make her a most difficult companion: she had no insight into the severity of her illness, kept on averring that if only someone had talked it over with her she would have recovered easily, and was indignantly angry that the operation had reduced her affects and her sense of pleasure; later she had further ground for complaint in that she developed 2 epileptic fits, and she has continued a disgruntled, angry woman, not paranoid but at odds with the world and lacking in any sense of gratitude for the strenuous efforts of many people to help her. The fifth, who had previously given up teaching through feeling herself ill-adapted to it, was of independent means without need to work, and led a life that was calm and pleasant, with quiet diversions but much indolence, which contrasted curiously with the mental strife and anxious self-questionings with drive to activity that she had shown before. Later she resumed teaching (but unsatisfactorily through personality difficulties) and was far less apathetic. The sixth also resumed her former life of leisure.

Two of these 6 illnesses seemed to be precipitated essentially

depressive state with recovery and then relapse, believed that her brain had been changed for someone else's, and that her own was projected into some future era and would be supplied to someone who was to be born hundreds of years hence, while her substitute-brain contained 2 people who scrutinized and assessed each other. Between whiles she entered into states of stupor, of quite irregular duration, in which she was extremely tense, resistive, and obstinate, and from which she would suddenly emerge into wild shouting with impulsive suicidal attempts. CASE 275, after becoming moody and moderately intemperate, went out in the daytime in her night clothes, called at a hospital and asked for a stomach pump to remove poison given her in some vitamin pills, escaped through the bathroom window at night to seek police protection, believed people had left secret signs on the walls of the house and were trying thus to control her mind. She developed fixed delusions that her eyes were to be gouged out, her tongue torn off, her bowels eviscerated, and that then she was to be shot; there was a snake pit at the end of the ward and the doctor's attaché case was full of snakes, very soft and almost inextricably squashed together; the other patients were all landladies from south-coast boarding-houses (in some of which she had lived during the war) and had come to see her die of Chinese torture.

This, then, was the sort of clinical picture, characterized by marked depression with suicidal impulses, and by delusional ideas which, though markedly influenced by the mood, had a bizarre quality that separated them altogether from reality and placed them within the schizophrenic field. Yet, it must be realized that these patients were fully orientated, clearly conscious (for at any rate long periods of time), frequently amenable to reason, would discuss their symptoms with intellectual clarity and with excellent rapport, and could give detailed but relevant accounts of their past lives. The fact that they were far from lost to the world made them often the more difficult to manage.

Two of these 6 cases had been brought to a markedly improved level, though still psychotic, by deep insulin; a third had been improved by a combination of deep insulin and electroplexy but had not maintained the improvement; the 3 others had been improved by electroplexy alone, but had never been restored to their pre-morbid level, and felt benefit only for a short time.

peripheral neuritis. In hospital he made himself very much at home, talked in a loud booming voice almost always about alcohol and his seductions of women, and was given to noisy outbursts of shouting in which he was abusive and obscene. Between these he was active in an aimless way, and quite content with his lot, vague as to why he was in hospital, disinterested as to where and what the institution was, never looking to the future, dishevelled and unemployable through unreliability. He was certainly hallucinated at times, hearing the voices of the police and of the doctors, and believing them to be relayed through the window and by the radio. He would not infrequently stand at the window and bellow back at the voices which he heard. He vaguely believed he was where he was owing to some sort of plot, but was not much concerned about it. He mistook identities, and was liable to assault other people on that account. At interview he knew where he was, though he did not know the county, he knew neither the month nor the year, nor had any idea how long he had been there. He gave a tolerably good account of himself, however, and believed himself in hospital either because he had tuberculosis (as had many other members of his family) or because he had venereal disease (he had had gonorrhoea more than once in the past, but never syphilis). His conversation was specially characterized by the vagueness and looseness of his answers, and he drifted from police persecution to tuberculosis without appreciation of any incoherence. He denied ever having had hallucinations, and did not appear hallucinated actually at that time. He could retain 6 digits forwards and could reverse 5, which was about commensurate with his intellectual level. He failed to grasp the cowboy story, and retained only 2 items out of 6 when asked to recall a name, address, and flower. There was no confabulation at any time, and he gave the impression of a deteriorated schizophrenic rather than of an alcoholic psychotic. After operation there was great improvement, which continued over a period of 2 years despite an isolated epileptic attack just after a pyrexial illness. The patient was in much better touch with his surroundings, was orientated in place and time, gave a better account of himself, ceased to be hallucinated, was not noisy or abusive, showed little irritability, and was usefully employable at simple tasks like gardening. He read newspapers, was in touch with current affairs to some extent, wrote letters to his family, and was no longer indifferent to their visits. He retained 6 digits forwards still, but could reverse only 4; on the other hand, he grasped the cowboy story and others without difficulty, and was no longer vague and discursive in his

by homosexual conflicts; the homosexuality has remained, but has been placidly accepted with neither conflict nor frustration despite an absence of post-operative sexual activity.

In two others, a restricted environment contributed to the development of illness in a shrinking personality whose lack of drive prevented them from overcoming their frustrations.

In CASE 275 the illness developed out of an increase in pre-existent psychopathic behaviour, for no obvious environmental reasons, while in the remaining CASE 272 there seemed no external precipitating factors beyond some mild domestic worries.

Thus, 2 of the 6 cases seemed to a large extent reactive, and 2 of them to a lesser extent, while the other 2 seemed scarcely reactive at all. As regards actual freedom from symptoms, there was little difference in the degree of recovery; the total result, however, was better in those with the sounder personalities.

SCHIZOPHRENIA WITH INITIAL TOXIC CONFUSION

In 2 cases the illness seemed to begin with a toxic state; indeed 1 of them was first diagnosed as a toxic psychosis and the other as Korsakow's psychosis. The illnesses were persistent; in the former for more than a year, in the latter for more than 5 years.

The latter patient was a man of 41, with poor heredity in that a sister had been a defective epilept though without history of intra-uterine infection or birth trauma, 2 paternal first cousins had committed suicide, and he himself was a dullard. Always moody, self-conscious, solitary, and inclined to bully, he had made a success of nothing that he took up, had wandered abroad, had been divorced, and had been erratic and unreliable in his work as in his temperament. He had been intemperate for some years when, humiliated by being rightly rejected from military service and having sustained business reverses on account of the war, he began to drink heavily at the age of 35. After a brush with the police on account of drunken behaviour, he drank increasingly, and at 36 developed an attack of delirium tremens He was admitted to a nursing home, where he had accusatory auditory hallucinations and believed himself the victim of a police plot. After the acute symptoms had subsided he was left disorientated in time, confused, incontinent, and without insight. He was diagnosed as Korsakow's psychosis at the hospital to which he was transferred, although there had never been any

be rowdy and unmanageable; she rubbed her hands on a chair all night until they were blistered; she was hostile; she refused food; she shouted sentences that were incoherent and meaningless. Two months after her admission she was given some treatment by electroplexy, which made her worse. This was discontinued in favour of continuous narcosis, which 'slightly improved' her. She was less noisy, had intervals of accessibility, and some of the time was quiet. Five days after the continuous narcosis and 5 weeks after the last electrical treatment she had an epileptic fit. (Blood Wassermann, Meinicke and Kahn reactions were all negative.) She remained much the same for a few weeks, and then again became increasingly excited as before. After 2 months of this she had more treatment by [illegible] 'slightly improved' leve[illegible] all [illegible] incoherently, resisting efforts to get her up, to get her into the fresh air, to get her washed, and to get her to take food. Although their incidence in time was irregular, the noisy periods just about equalled the silent periods. It may be noted that during all this time, though she often had medinal gr. x b.d. to damp down her excitement, she slept adequately without sedation. She would have rare moments of 'comparative lucidity.' She was noted to 'hear and answer persecutory voices,' but it was impossible to obtain any details about these or evidence other than the bald statement. Such 'comparatively lucid' moments soon gave place either to a silent and stubborn apathy, or to a noisy troublesomeness with destruction of clothes and crockery, repetition of words over and over again, incoherent shouting, and a restless impulsiveness.

At interview the patient was found to be a wild-looking woman, who was dragged into the room by nurses, showing much reluctance but no determined opposition. She winked at me in a conspiratorial way, and then clung to the radiator. When asked questions she answered energetically and very rapidly, sometimes loudly but for the most part in a low mumble. The answers were all unexpected in that they were irrelevant, apparently absurd, and the sentences often devoid of grammatical construction. Some of the time she was entirely silent. Only one sensible reply was elicited and that was when the nurse coaxingly asked her, 'Why don't you answer?' The patient said loudly and clearly, 'Why should I?'

The inappropriate behaviour, the sudden excited answers and the lapses into sulky silence, the sudden emergence from a seemingly preoccupied state into a seeming rapport were very striking. At onset the condition had been thought a toxic psychosis; but it

conversation. He still talked of drink and women, but now spoke on general subjects too. He looked after his personal appearance well. He could quite well have lived in the outside world in sheltered circumstances, but his parents were elderly and felt themselves unable to undertake the responsibility lest the patient again took to drinking and involving himself with undesirable women. The patient himself had still little initiative, and though he spoke in a conventional way of going home, he tolerated his environment very well and took no active steps to leave.

The other case showed a remarkable phenomenon.

CASE 270 was a woman aged 41, and a psychopathic personality in the sense of having been erratic, impulsive, wayward, extravagant, unreasonably discontented, labile, with poor judgment in her love life before marriage and infidelity to her husband after it, with the contraction and communication to him of venereal disease. She developed an infection of the hand at a time when, already worried over a diphtheria scare, she was nursing her husband and three children through an attack of tonsillitis. In opening a tin she sustained a deep cut in the left thumb. This became inflamed and the next day the patient was thought to be 'light-headed.' She ran up and down stairs purposelessly, was seen vaguely leafing through medical books in a worried way, but her activities were not directed towards any useful end. Later that day she became delirious and was admitted to hospital. She is said after a few days to have become clear in her mind, but 10 days after that her conversation became rambling, and when visited by her husband she incorrectly asserted that their youngest child was dead, and intermingled her reflections on this supposed tragedy with an excited description of the Christmas party in the hospital, together with ideas of spiritualism and of being controlled by mysterious forces. She became increasingly excited and unmanageable, and was transferred to a mental hospital some 3 weeks after development of the illness in the first place. In the mental hospital she remained 'restless, noisy, excited, rambling, confused, unable to give any rational account of herself, and completely inaccessible to examination.' She was also frequently resistive and difficult with food. For the first week in the mental hospital she ran an irregular temperature which then settled, but without improvement in her condition. A few days later the temperature rose again and the thumb was re-opened. A fortnight after that the wound had healed completely and there were no physical signs then nor at any time after except for some irregularity of menstruation. The patient continued, however, to

From this point onwards she interjected nonsensical answers at intervals. Asked what she would wish to do if she were not in hospital, she said that she would run her house, that she ought to be doing so now, that she was easily capable of it, 'Of course, no doubt about it.' She started also to look round the room most of the time, rather as though searching for something—perhaps for a means of escape. In between these exploratory glances, she would shoot quizzical looks at me, smiling and finding me funny. 'Your name wouldn't be Angus, would it? No? Or Humphreys? No? Or Daniel? No? Or Wilson? No, it wouldn't be, would it?' Asked why she asked, she said very archly, 'Ah, *I* know,' and asked what she knew, she said, 'Too much, a lot of things I know.' It was found that she could be distracted from this nonsense if she were asked questions in a particularly earnest and emphatic manner. When asked if her husband came to see her, she answered with pride and quite correctly that he hadn't missed a visiting day ever since she'd been there, and when asked what she talked to him about, she said, 'Oh, just how they are, and what they've been doing at home.' When making these appropriate answers her manner was quite different, less off-hand, airy, frivolous, and jocose. She said, in answer to questions, that she heard the voices of her father and mother talking to her, mainly at night, and that the previous night her mother had been saying that she was glad the patient had been brought up in a nunnery, although she hadn't been herself. (The patient was not brought up in a nunnery.) She found the voices a nuisance. 'Last night they were a bit too much.' But having said this she would answer no further questions seriously, became restless and fidgety and made nonsensical answers. She would not co-operate at all on tests, although she submitted to a physical examination which proved negative.

Both the medical officer and the Ward Sister had noticed, of course, that it was possible to get the patient to talk some sense, but it was a rare event. The Ward Sister had something more to add: 'It's a funny thing, but her husband says when he comes on Sundays she doesn't say one nonsensical thing, she never says a wrong word. The whole family are all on to me to get her discharged. And she must talk some sense to them because they say she's said, "If they keep me here in a noisy ward, how can they expect me not to relapse?" I mean, that's quite sensible. But she never will talk sense to us. You've got to sort of shout at her, and then she'll talk sense for a moment. But otherwise it's all this nonsense. . . .'

The Ward Sister was inclined to believe what the husband said;

persisted for more than a year substantially unchanged after healing of the original lesion. Further, while the patient may have had her periods of clouded consciousness, she knew her way about the hospital, appeared to recognize her family to whom she sometimes spoke some words of sense, was capable of dressing herself, keeping herself clean, and rising and retiring at the appropriate times, nor was she faulty in habits. She was considered to be a case of catatonic schizophrenia, precipitated by toxaemia.

When seen 6 months after operation, the patient entered the room without hesitation, looking alert and bright-eyed, said 'Good morning' spontaneously, and when asked to sit down did so in the chair obviously intended for the doctor. She changed chairs at once when asked to. She was orientated for place, but not in time, saying she had been in the hospital just over a year (18 months) and having no notion of the month or the date. She was aware of having had 2 operations, 1 on her hand and 1 on her head, but would give no estimate of when the latter had taken place. She said that she was 'extremely well,' and that her recovery was due to having plenty of rest. She said that she felt better in that she was 'more energetic. I like to get out. I don't like to be behind locked doors. I don't think that I should be here at all.'

Q. 'Why did you come here?'

A. 'I cut my hand with a tin-opener. I was opening a tin for the animals, I feed my cat on the dog's food. My arm got poisoned.'

Q 'Yes, but why did you come here?'

A. 'I came here by ambulance.' (Correct.)

Q. 'Did you go anywhere else first?'

A. 'I may have been in the Mayday Hospital.' (Incorrect.)

Q. 'Where's that?'

A. 'You know the Mayday Hospital, it's in Croydon.' (Correct.)

Q. 'When were you there?'

A. 'I was born there.' (Correct.)

Q. 'Why did they bring you here?'

A. 'For an operation on my hand.'

Q. 'Were you all right apart from your hand?'

A. 'Oh, yes, perfectly, I should never have been kept here.'

Q. 'I didn't think you very well last time I saw you, but I don't expect you remember that?'

A. 'Oh, yes, you palled up with a squad of policemen one day, didn't you?'

Q. 'No, I never have. How do you mean?'

A. 'You didn't? Well, it must have been your younger son.'

produced negligible improvement. After some years of this the matter was summed up at one famous hospital: 'She is the type of hysteric that can only be described as malignant and in which there is the considerable possibility of real deterioration.' Evidence of schizophrenia had been looked for, but found wanting. There were never any organic findings except for vaginal infections; blood and cerebro-spinal fluid were negative. The only positive feature was a low I.Q. which was unreliable owing to the patient's antagonism and lack of co-operation, and which, at 16, indicated a mental age of between 11 and 12 years. By the age of 23, however, she was considered probably to be schizophrenic, owing to bizarre hypochondriasis, spells of violence, neurotic fears, coupled with mannerisms and religiosity. She was given a course of deep insulin combined with electroplexy without effect. At interview she spoke in an exaggeratedly cultured fashion, with large vocabulary; her verbal facility contrasted strangely with her performance in writing. She was timid and shaky, professing to be worried lest she left out something vitally important in her account of herself; at the same time, however, she was evasive and took little trouble to ensure accuracy. She had an enormous number of hypochondriacal complaints and her manner was that of the hysterical psychopath. Withal, however, she seemed genuinely anxious and depressed. It was thus difficult to sort out which symptoms were actually experienced, and which were dragged into the picture for their dramatic value. She said that she believed herself to be the subject of demoniac possession in a literal way, and was much preoccupied by questions of whether she were in a real or in some spiritual world. She denied hallucinations, but in a written statement she declared that evil spirits spoke to her and gave her commands to kill people, smash things, commit suicide, while she heard mysterious knockings and rappings and saw lights flashing in her bedroom at night. She felt that people were testing her out and setting traps for her. She was obsessional in conversation, and in behaviour she was meticulous without being ritualistic. She was a continual nuisance, whining and complaining. She was considered on the whole to be a ruminative schizophrenic with a hysterical psychopathic personality. She was discharged from hospital 4 months after operation without complaints. Seen 6 months after operation, she was more easily tired, proffered that she had less feeling, and outwardly showed affective blunting. She had some hypochondriacal complaints, but put up with them quite cheerfully. She talked readily and brightly, almost patronizingly, and several times called the examiner 'My dear.' She scoffed at her

the medical officer thought the husband greatly exaggerated. The husband did not believe the hospital authorities when they said the patient talked nonsense, until he took the patient home for a week-end during which she was perfectly normal until they got near the hospital on her return, when she surprised him by starting to talk in a rambling and incoherent fashion. Her discharge was applied for, but when she appeared before the committee she was unable to make a single sensible remark. Two months after that she was conducting herself reasonably, talked rationally, and returned home where she took up her duties almost at once, and has shown no deterioration in her housekeeping efficiency. She denied any recollection of the illness from a few hours after cutting her thumb until a few days before her final discharge from hospital.

Little doubt was felt that the patient had feelings of hostility towards the hospital, which she showed in various small ways, but the psycho-dynamics underlying this behaviour could not be elicited, at first owing to her inaccessibility and later owing to her amnesia, or alleged amnesia. But the post-operative state was remarkable in that it suggests the presence of a whole and intact mentality in such unstable equilibrium that it could be upset and disintegrated by certain stimuli, and restored and reintegrated by others. The same phenomenon was observed to a lesser extent in the pre-operative state of another catatonic patient, who would emerge completely when visited by his family, would talk rationally, coherently, and with animation, but would relapse into a semi-stuporose state as soon as they had gone.

Schizophrenia with Hysteria

The remaining case, from the diagnostic point of view, is more odd.

A girl of 25, the only child of a defective mother and an alcoholic *father who lived in squalid circumstances, had been in 15 different* hospitals from the age of 10 onwards, for periods ranging from a few weeks up to over a year. These included children's hospitals, voluntary hospitals, general hospitals, observation wards, hospitals for nervous diseases, and mental hospitals. The complaints included gonococcal vulvo-vaginitis at 14, hysterical contractures and tremors, hysterical fits, chronic constipation, dermatitis artefacta, imitations of chorea, and a complete and sustained hysterical flexion of the trunk on the thighs. Placements, foster-homes, specially arranged employment in sheltered conditions, psycho-therapy, etc.,

trend, and they showed less deterioration than the so-called 'incontestably schizophrenic cases' ill for a comparable period of time. Of these 9, 5 showed full recovery from their symptoms and resumed the lives they had led before operation, though 1 of them—always erratic—was post-operatively more so than before. The sixth was an unstable schizophrenic adolescent boy who showed disabling disorders of behaviour after operation. They had been present in slightly different form before it. Post-operatively he tolerated himself much better, and was able to live out of hospital though unemployable, whereas in absence of operation lifelong hospitalization had seemed inevitable. The seventh lost his schizophrenic features in mentation, but in behaviour remained a social problem. The eighth, who had complained for 5 years of depersonalization with affective loss, as opposed to depression, and in whom the condition was almost monosymptomatic, tolerated her state slightly better after operation, though the symptom remained unchanged. This slight advantage was offset by the development of epilepsy, while she showed also signs of an increasing schizophrenia. This seemed to be occurring in spite of, rather than because of, operation. The ninth patient was the man who died.

(4) Eight patients showed schizophrenic illnesses with very prominent depressive features. They differed from cases in the group of schizophrenics with affective colouring already considered, in that the affective components in the illnesses of our present group approximately equalled the schizophrenic components both in persistence and intensity, while the illnesses themselves seemed of a less malignant quality in that the patients were better preserved and with less deterioration over comparable periods of time. In 2 of these 8 cases the illness resembled involutional melancholia for some time at and after the onset. All the patients became able to live at large though 1 had a 2-year convalescence interrupted by a long hypomanic phase which had not occurred in her life before. None of the patients showed any schizophrenic residua, except for a quantitative loss of affect, with consequently impaired enjoyment, in 1 case;

former notions of demoniac possession, but said that these, and some auditory and visual hallucinations, had been real and frightening at the time. She was no longer suspicious of people. She went where she wanted without fears. She was still overly religious, and was mannered. Indeed, her ultra-elegant appearance and exaggeratedly refined speech seemed fantastic when her home background was known. It may be noted, however, that she had adjusted well to her home life, which had been a constant problem before. She did not tell nearly as many lies, though it seemed certain that she was romancing when she said she was about to become engaged to an Anglo-Catholic priest. She worked steadily, though part time, at domestic work. A year after the operation she was doing full-time work as a waitress, still had some hypochondriacal complaints, but had not attended hospitals except to get some help in keeping down her rapidly increasing weight and in aiding her chronic constipation. She had also married, precipitately and for no obvious reason, a Burmese cook who worked in the same restaurant. Her energy was improved, her affect appeared normal, she seemed more serious and less romantic. Soon after this she lost her job through having several attacks of vomiting, not as a result of pregnancy or obvious organic cause. She has remained, however, markedly more stable than was pre-operatively the case.

Summary

Thus, out of 20 cases considered to have been within the schizophrenic range, though not obviously so at first sight, we get the following results:

(1) One died 10 days after operation as a result of a pulmonary embolus which arose from thrombosed haemorrhoidal veins, to the development of which the operation and some post-operative apathy may have indirectly contributed.

(2) Three patients, not previously epileptic, developed epilepsy: 1 had frequent fits substantially controlled by medication so that they were reduced to 2 in 6 months; the other had 2 isolated fits in 2 years, the second of which occurred despite medication. These were both women. A man had 1 fit.

(3) There were 9 patients whose conditions were straightforwardly schizophrenic when all the facts were taken into consideration, though not obviously so at sight; their illnesses showed fluctuations without a steadily downward

(8) With regard to response to previous treatment, 3 of the 19 survivors had had no form of special treatment, while 6 had been treated only by electroplexy, 5 only by deep insulin, and 5 by both. Of the 6 treated only by electroplexy, 4 had responded favourably though transiently, of whom 2 recovered fully after operation, while the other two were well apart from some apathy; of the 2 who had not responded favourably to electroplexy, 1 fully recovered after operation but the other was substantially unchanged or worse. Of the 5 who had been treated only by deep insulin, all had responded favourably, and 4 recovered after operation while the fifth was improved. Of the 5 who had been treated both with deep insulin and with electroplexy, 2 had responded favourably and fully recovered after operation; of the 3 who had not responded favourably, 2 recovered fully after operation, while the third showed a quantitative loss of affect with diminished control of previously present psychopathic traits. These figures very slightly suggest that a favourable response either to deep insulin or to electroplexy may be associated with a favourable response to operation in the milder cases exemplified by this group.

(9) Of the 4 cases who had been ill for 5 years or more, none fully recovered.

(10) With regard to that combination of a sudden onset of illness coupled with development of stupors during its course, which we have previously noted as a favourable prognostic sign, we find in this group the following results:

Of 7 patients who showed this combination, 6 fully recovered after operation and 1 was fully recovered apart from some apathy. Of 6 patients who had had illnesses of sudden onset without development of stupors at any time, 5 fully recovered and 1 was improved. Of 5 patients whose illnesses had shown an insidious onset without development of stupors, only 1 recovered; but the other 4 had been ill for longer than 5 years. The 1 patient whose illness was marked by stupors, but with an insidious onset, did not fully recover. When, therefore, the time factor is taken into account, there is no evidence in this group that a

and a fundamental apathy in contrast to a previous activity in 2 others. These same 3 patients showed some degree of personality change in line with these residua, while 2 of them, always psychopathic, became difficult to live with. Six of the 8 resumed their previous lives, the others (of independent means) lived contentedly in new surroundings.

(5) There were 3 cases of an unusual sort. In 2 of them the illness followed intoxication—in one case a staphylococcal septicaemia, in the other by alcohol. The former recovered entirely; the latter lost all his schizophrenic features after a 5-year illness, and could have lived at home in propitious circumstances, but remained somewhat unreliable and had no employment to take up. The third unusual case showed mild schizophrenic developments after many years of florid hysteria; she recovered to a level slightly better than her pre-morbid normal.

(6) Taking all the cases in this group together, 18 out of the 19 survivors were discharged from hospital, and the nineteenth could have been discharged if he had had suitable relatives. Twelve out of the 19 had recovered and resumed their former lives: of the 7 who were not fully recovered, 1 was in all ways socially acceptable but apathetic, 1 had a quantitative loss of affect and less control over psychopathic traits, 2 showed a residual disorder of behaviour which, though compatible with living at large, made a secluded environment desirable, 1 had some residual apathy which, coupled with formerly alcoholic propensities and lack of any qualification for employment, made retention in hospital desirable in the absence of suitable care at home, 1 patient became less schizophrenic but still a grave social problem, and 1 became progressively more schizophrenic in a slight degree coupled with development of post-operative epilepsy.

(7) If these results be compared with those in the groups of (*a*) incontestably schizophrenic cases, (*b*) schizophrenic cases with affective colouring, (*c*) recurrent schizophrenic cases, it would suggest that the further one moves along the scale away from schizophrenia as a process disease towards mixed or less malignant types of schizophrenic illness, the better *becomes the prognosis for operative treatment.*

INCONTESTABLY SCHIZOPHRENIC CASES (without remissions)

			POST-OPERATIVE EPILEPSY				CASES STILL IN HOSPITAL						CASES DISCHARGED FROM HOSPITAL							
Total	Deaths at Operation	Delayed attributable deaths	Men Single occasion	Men Multiple attacks	Women Single occasion	Women Multiple attacks	Worse	Not improved	Conduct improved	Markedly improved	Improved to home level	Discharged against advice	Discharged though psychotic	Discharged psychotic relapsed	Discharged with psychotic traces	Discharged with psychotic traces and relapsed	Discharged recovered	Discharged recovered but relapsed	Recovered after relapse	Sustained recovery
77	3	2	0/41	9/41	2/33	2/33	3	15	23	5	2	6	8 =10%	1	7 =9%	2	5 =6·5%	1	0	6 =7·8%
PRESERVED PARANOID CASES																				
8	0	0	0	0	0	0	2	2	0	0	1	0	2 =25%	0	0	0	1 =12·5%	1	0	0
SCHIZOPHRENIC CASES WITH AFFECTIVE COLOURING (without remissions)																				
35	0	2	0/2	0/2	1/33	0/33	1	4	9	5	0	0	2 =5·7%	1	4 =11%	0	10 =28·6%	1	1	9 =25·7%
RECURRENT SCHIZOPHRENIC CASES (with remissions)																				
19	0	0	1/8	3/8	0/11	0/11	1	1	4	0	0	0	3 =15·8%	0	1 =5·3%	0	8 =42%	4	3	4 =21%
OTHER AND NON-CLASSICAL SCHIZOPHRENIC CASES (without remissions)																				
19	0	1	1/5	0/5	0/13	2/13	0	0	0	0	1	0	1 =5·3%	0	4 =21%	0	12 =63%	0	0	12 =63%

combination of sudden onset with development of stupors is a favourable one, although there is no evidence against it.

(11) Of the 4 cases whose illnesses began before the age of 20, only 1 recovered. Of the other 3, 1 was improved, but the condition of the others seemed to be progressive.

(12) With regard to the relation between previous personality and degree of recovery achieved, no fewer than 5 of the 19 patients who survived operation were considered to have had pre-morbid personalities within normal limits; of these 4 fully recovered, and the fifth had been ill for more than 5 years. Eight were considered to have been schizoid personalities, of whom 4 recovered, 1 was recovered apart from some apathy, 2 were improved, and the seventh had been ill for more than 5 years. Six were considered to be psychopathic personalities, in the sense of having been persistently erratic with anti-social behaviour, and of these 4 fully recovered while 2 were much improved, but 2 out of the 6 showed an increase in psychopathic behaviour of a tiresome kind. These results suggest, like our previous ones, that the total outcome is related to the previous personality.

operation; but they had continued at work only with great difficulty and while undergoing various forms of treatment (such as electroplexy, narco-analysis, and psycho-therapy) at the same time. Ten of the 24 had had previous admissions to mental hospitals for essentially similar manifestations, 1 of them on 7 and another on 5 occasions. Four others had been admitted to general hospitals for much the same reasons, and another 4 had been previously treated in neurosis centres. Eight patients had had extensive psycho-analysis, 13 had been subjected to various forms of physical treatment, and all had had psycho-therapy. All except 1 had been off work for considerable periods at one time or another. Even those who were housewives had been prevented by their symptoms from any semblance of efficiency, and had become not merely passengers, but handicaps, in the home. Only 2 of the patients were able to lead lives with much semblance of normality, and both those were continually tormented by doubts and worries. The others were incapacitated from doing almost anything about which they cared, either through fears of contamination, fears of meeting people, intense embarrassment, or through their rituals being so exacting as to render social life impossible.

CASE 109 (see page 363) had had disabling symptoms for more than 40 years, and for 20 years had risen at 6 a.m. in order to complete a long washing and toilet ritual which was never finished, despite an energetic zeal, before half-past 9 or 10 o'clock. This involved so much toilet paper, soap, hot water, and prolonged use of the bathroom that, through having repeatedly been asked to leave her lodgings, she was obliged to live in a flat of her own and beyond her means. She was so late in starting for work that the further expense of a taxi was usually necessary, while both to make up for lost time and to satisfy a morbid over-conscientiousness she was seldom able to return home until 9 o'clock at night, when further rituals involving the wearing of rubber garments, quantities of disinfectants, and acts of sterilization would keep her from bed until 2 o'clock in the morning. Almost the whole of each Sunday was devoted to even more extensive rituals, sometimes to the entire exclusion of meals. Treatment by psycho-analysis, deep insulin, and long periods of supportive psycho-therapy had been powerless to effect any substantial change.

CASE 94 had had progressively tiresome and disabling symptoms

OBSESSIONAL CASES

It is only to be expected that there should have been in this series a large number of cases with obsessional features of one sort and another. Such cases occurred in almost all the diagnostic groups, though they were more evident in the depressive states than in the others. Indeed, 2 of the cases might have been included in the depressive group, since the depression became the clamant and dominating feature, on account of which operation was finally undertaken. But they were considered to have been depressed through the fact of being harnessed by their obsessive traits to modes of thought which themselves induced the depression; in that sense, the primary condition was an obsessional state with depression as a secondary development, and they are therefore considered among the obsessional cases. Those cases, however, in which the obsessional features were incidental to affective or schizophrenic illnesses, or occurred as items in a psychopathic personality, are included in the affective or schizophrenic or psychopathic groups, according to which elements of the syndrome predominated in the clinical picture.

There were, however, 29 patients who are best considered under the general heading of 'obsessional states.' Of these there were 24 who were operated on essentially for the obsessional symptoms themselves. The other 5 we shall consider later. These 24 patients showed different degrees of depression, tolerably marked in 15 of them, and varying between vexation and despair as a reaction to their obsessionalism; but such moods did not dominate these patients entirely, and the obsessional features themselves remained not only the fundamental, but also the plainest and most preponderant items in the clinical picture.

The severity of these states may be gauged not only from the histories of some sample cases, but by the fact that all had found hospital care necessary apart from the question of operation. To that extent, all 24 were incapacitated from working. Four out of the 24, it is true, had remained in employment up till periods varying between a few weeks and a few months before

from which he was powerless to detach himself; he was unable to referee through the recurrent conviction, against his better judgment, that his genitalia had become suddenly exposed: these compulsive thoughts and obsessional preoccupations prevented any normal participation in social life.

No patient in this group had had symptoms for less than 3 years, though 2 of them (both severely incapacitated) were under 20. As an average for the group the duration of symptoms was not less than 13 years.

Their performance of these rituals, or their rumination on these topics, was not the self-indulgence of a sick person's fancy. It was a torment which, in the grip of something stronger than themselves, they found themselves compelled to undergo. Resistance to this compelling force caused a mounting tension with irritability, restlessness, and fear, and with no possibility of peace of mind. The fact that they recognized fully the absurdity of the acts and thoughts caused exasperation, but did nothing to help them withstand their cogency. The only solution for these patients was to flow with the tide of their obsessions and compulsions: appeasement was their only chance of peace.

Perhaps the worst example was CASE 91 (see page 373). A 46-year-old Frenchman, with a history of lifelong meticulousness, developed obsessive-compulsive traits soon after the first world war in a setting of unrest and doubt. As his difficulties were resolved, these traits diminished, but underwent a severe exacerbation in 1931 when he found himself the victim of a particularly cruel business swindle perpetrated against him by people whom he had had every reason to trust. With a temporary retirement from business, shelter from worry, reassurance and the formation of plans for the future, his obsessive-compulsive state was brought to some extent within control. At any rate, despite many financial and domestic difficulties, he successfully resumed business; he was erratic in that sometimes he would work all night, and in general worked too hard and long under the influence of his obsessional drive, the effects of which he would then mitigate by bursts of social activity with much gaiety and late hours; but the business flourished and by 1940 was working on a considerable scale. Then came the fall of France. The only possibility of continuing was to collaborate with the Germans. The patient refused this offer and the business was confiscated. The whole organization, together with his achieve-

for at least 23 years, not so much in the form of fixed rituals (although fears that she might do harm with knives or through carelessness in leaving on gas taps had led to the routine taking of extensive precautions), as in the form of fears: fear that a relative of a relative who had had cancer might have conveyed some infection to the sofa cushions would lead to repeated laundering; fear of unspecified contamination would prevent her from eating any food which she herself had not prepared with elaborate care; fear that she might have knocked against, and thus accidentally harmed, people in the street could cause her to follow them (going in the wrong direction and out of her way) to ensure that they were not undergoing any sudden dissolution; fear that the food might spoil by over-cooking would lead to repeated requests for reassurance as to the time (though the clock was before her eyes) or as to whether the oven were set correctly, though she knew perfectly well that it was. 'It was the same in the car, every time I passed a turning I had to look to make sure that my husband hadn't knocked somebody over, and I did that until I was cured by getting a stiff neck. . . .'

Case 93 (see page 367) had had to do everything perfectly for more than 20 years, straightening curtains, clothes, seams of stockings, arranging the household utensils perfectly in the cupboards, seeing that each coat hanger was just the same distance from its neighbour, replacing the soap exactly whence it was removed, and often having to perform these acts so that they synchronized with counting. Gas taps, water taps, doors and windows, all had to be examined again and again to ensure of their closure; letters had to be read and re-read, envelopes had to be repeatedly examined before posting. Everything was a labour of repetition. 'It was a torment to wake up in the morning. . . .'

Three of the patients lived in a perpetual atmosphere of disinfectants, and in the house of one of them the smell of phenol was so overpowering as to cause actual gasping with difficulty in speech. Several of them, of course, washed money again and again. A girl of 17 ruined clothes of which she was proud by sousing them in cleansing agents which left the bathroom repeatedly awash, and would hack away the leather from new shoes in order that she might put her feet into them with a touchless technique. Case 99 (see page 376), who might well have attained world fame in the boxing ring, was hopelessly hampered by convictions of guilt, which, through association of ideas, might suddenly be suggested to him at any moment and

And what of the paper: was it a suitable piece, was it to be this way up or that, was he to write on the rough side or the smooth, supposing it were the right kind of paper at all? The difficulty in starting was thus so great, and the interruptions that occurred were so numerous, that it was impossible for the lists to be finished. This failure induced in the patient so much anxiety that it became necessary for his wife to make the lists at his dictation. With great difficulty this time-consuming procedure was cut down to 1 session every 3 days; a session would last about 6 hours. By the time the session came round the patient would usually have between 170 and 190 items to remember that had to be written down. His system of recall did not seem an easy one, though it worked; each item was memorized according to the time at which it had occurred to him. He would thus start at item 190 and work backwards, through Thursday, Wednesday, and Tuesday, to item 1. These items ranged from quite important matters such as paying bills, transfers of money, investments, and complicated legal affairs, which would be indiscriminately mixed up with such questions as whether an electric light bulb should be renewed, if there was dust behind the bureau, and whether the second button on his blue pyjamas needed to be sewn on. When he forgot an item he would not be able to go on to the next until he had remembered it, and such failure to recall would throw him into a transport of anxiety which, through further impairing his concentration, tended to increase. But he almost always managed to complete the list though there would be awkward moments if there were callers or similar disturbances, and when, as happened not infrequently in post-war Paris, there was a sudden failure of the electric light.

This striving toward perfection found expression in innumerable other ways, some of them socially embarrassing. 'If I get up,' the patient said, 'I have to look under the chair and under the cushion every time.' His wife said, 'He methodically has to look under everything in the room if he leaves it, under every bit of furniture everywhere, he has to look under each plate on the breakfast tray, and if he unfolds the napkin he has to make very sure that nothing has fallen out of it, and that there's no dirt or spot on anything.' But the patient added, 'If I see the spot actually made it doesn't matter.'

There were also, of course, elaborate toilet rituals. The process of defaecation lasted not less than 3 hours. The passage of each faecal mass called for a separate toilet with three pieces of toilet paper folded in triple thickness on every application, after each of which the plug had to be repeatedly pulled until the closet was

ments and plans for the future, disappeared: so did his income. No one likes to be cheated, and to be cheated twice on a grand scale is an unnerving experience. The patient reacted to it not with depression, but with a general uneasiness which reflected the extent to which his confidence in life and in himself had been undermined. He became apprehensive for the future, indignant with the present, and regretful for the past. He managed to get to America where, for about 6 months, the novelty of his surroundings and a sheltered life were helpful. During this time he re-married. His second wife was someone whom he had known for some time, and to marry her had been one of the objects of his leaving home. But the fact that he was cut off from his relatives without news of them, that he had (as a foreigner) to be interrogated by the police and to report to them, that he was away from his country in its crisis, that attempts to undertake patriotic activities failed for various reasons, that he could form no plans for the future, and that, with the added responsibilities of marriage, his financial security was steadily falling, combined to add to his uneasiness. He became increasingly hesitant and uncertain of himself until he was actually paralysed by doubt. It seemed to be both to allay his doubt and also on account of it that rituals increasingly developed. They gained on him steadily. By 1946, despite much hospital treatment, he was so doubtful that he had repeatedly to be reassured that he was not getting into his bath with his watch and pyjamas on (though he knew that he was not); he had to be reassured when eating that the piece of meat was on the end of his fork and then that he had placed it in his mouth; he had to be reassured that he was holding the fork by the right end; he had to be reassured that he had not dropped morsels of food on the tablecloth as his hand journeyed from plate to mouth. He had to be reassured that he had taken off his clothes correctly, and that he had put them on correctly. Creases had to be smoothed out, and lounge and pyjama suits had to be scrutinized from every aspect, both by himself and other people, to ensure that they were free from blemish. He had to be reassured that he had not forgotten to do things which he knew perfectly well that he had done. Then, in order to ensure that he did not forget things in the future he would have to make enormous lists of what he had to do. But at once the very making of these notes would become fraught with possibilities of error. If he wrote with a pencil, would it be better to write with a pen? If he wrote with a pen, did he really hold it between thumb and forefinger, and, if he did, was this right or wrong? Did he really write with the point, that was right, wasn't it?

And what of the paper: was it a suitable piece, was it to be this way up or that, was he to write on the rough side or the smooth, supposing it were the right kind of paper at all? The difficulty in starting was thus so great, and the interruptions that occurred were so numerous, that it was impossible for the lists to be finished. This failure induced in the patient so much anxiety that it became necessary for his wife to make the lists at his dictation. With great difficulty this time-consuming procedure was cut down to 1 session every 3 days; a session would last about 6 hours. By the time the session came round the patient would usually have between 170 and 190 items to remember that had to be written down. His system of recall did not seem an easy one, though it worked; each item was memorized according to the time at which it had occurred to him. He would thus start at item 190 and work backwards, through Thursday, Wednesday, and Tuesday, to item 1. These items ranged from quite important matters such as paying bills, transfers of money, investments, and complicated legal affairs, which would be indiscriminately mixed up with such questions as whether an electric light bulb should be renewed, if there was dust behind the bureau, and whether the second button on his blue pyjamas needed to be sewn on. When he forgot an item he would not be able to go on to the next until he had remembered it, and such failure to recall would throw him into a transport of anxiety which, through further impairing his concentration, tended to increase. But he almost always managed to complete the list though there would be awkward moments if there were callers or similar disturbances, and when, as happened not infrequently in post-war Paris, there was a sudden failure of the electric light.

This striving toward perfection found expression in innumerable other ways, some of them socially embarrassing. 'If I get up,' the patient said, 'I have to look under the chair and under the cushion every time.' His wife said, 'He methodically has to look under everything in the room if he leaves it, under every bit of furniture everywhere, he has to look under each plate on the breakfast tray, and if he unfolds the napkin he has to make very sure that nothing has fallen out of it, and that there's no dirt or spot on anything.' But the patient added, 'If I see the spot actually made it doesn't matter.'

There were also, of course, elaborate toilet rituals. The process of defaecation lasted not less than 3 hours. The passage of each faecal mass called for a separate toilet with three pieces of toilet paper folded in triple thickness on every application, after each of which the plug had to be repeatedly pulled until the closet was

scrupulously clean. This would be continued until defaecation was complete, after which there would be similarly scrupulous acts of washing. The whole of this was accompanied by marked anxiety; the patient sweated always in the palms of the hands and on the soles of the feet; his toes were always tensed in plantar-flexion; and in association with his anxiety he had bouts of urinary frequency (accompanied by facial pallor) which of course led to further washing rituals.

It was thus sometimes impossible for him to leave the house or even to dress all day. Otherwise, after the toilet ritual, '. . . he emerges, completely exhausted, about 3 o'clock, and he then often has to have an injection of amytal to calm him down.'

The dependence on others involved in this life (for even the act of defaecation, as well as washing, dressing, eating, etc., involved demands for help and reassurance) was so extreme that one cannot but suppose that had it been firmly handled in the beginning it would have got less out of hand. But treatment in hospital, psychoanalysis, supportive psycho-therapy, persuasion and re-education, electroplexy, had all failed to make any noteworthy difference to the patient's condition, and though there may have been a measure of hysterical acquiescence to the demands of this compulsive state, some degree of acquiescence was inescapable and the condition itself of a fearful severity. The patient was not of the whining hysterical kind. His temperament was gay, he had much humour even in his illness. He was sociable, well known, well liked. He was intelligent and able. He was a good shot and a good lawn-tennis player and a judge of wine. He still retained a capacity for enjoyment and an appetite for life.

A less severely disabled patient (Case 101), but one typical of the group as a whole as regards severity, was a woman of 53 who said: 'I've been on and off like this for about 9 years. . . . I think it came on gradually. If I'd put the kettle on I kept having to lift it up to make sure the gas was flaming underneath. Of course I could see without lifting it up, but I had to do it all the same. It wasn't so bad if anyone was with me. And when I went to open the street door, oh, it was terrible. I'd go to the door with confidence and then when I'd opened it I couldn't shut it, there I was pushing the door backwards and forwards, it was sort of not knowing what to do, I'd be pushing it backwards and forwards and backwards and forwards for a minute or more till I could concentrate, and then I'd have to make

sure that I'd shut it properly. I'd have to keep on looking, and it was just the same when I went to the meat safe, same with the gas taps, frightened to turn them on and frightened to turn them off. I was like that all day about one thing and another. I couldn't satisfy myself about nothing, I had to leave the washing for my girl to do in the finish. Had to count the number of times I'd rub when washing, used to have to do it 4 times and then another 4, and if anything came into my mind I'd have to do it again, and wringing it out, it was just the same. It was tiring, what used to take me about 2 hours would take me 6 hours in the finish, I'd be worn out doing nothing. One day I started scrubbing the safe out, only a small meat safe, but I couldn't finish it. . . .'

This was the sort of case-material that comprised the group of 24 patients with obsessional states which we are considering. We will now review the results.

Results

(1) One patient died of cerebral haemorrhage.

(2) One patient, not previously epileptic, had 2 fits, in the 23rd and 35th post-operative months.

(3) Of the 23 survivors, none was worse, 1 was unimproved, 1 was slightly improved, 1 was distinctly improved though retaining many handicaps, 9 were very substantially improved, and 11 were relieved of their obsessional symptoms altogether.

Case 106. The patient who was virtually unchanged was a 36-year-old man who had lost his sight during his twenties after a long period of discomfort with irido-cyclitis. He had always been meticulous and finicky for as long as his family could remember, but had never been punctilious about times, so that he was usually late (except for his work) and would find something to do at the last moment which prevented punctuality. He had been something of a model child who practically never got into trouble. He was over-attached to his mother, less so to his father, and he centred his interests in his family life. He had a few friends whom he did not know intimately. At school he was regarded as particularly trustworthy. On leaving school he was placed in business with a relative, but his parents thought the atmosphere unsuitable for one of tender years, since they feared the effect upon him of bad language, drinking,

and the example of commercial travellers, to which he was there exposed. The patient himself expressed a keenness for window-dressing and worked in a haberdashery shop thereafter. He was gentle and considerate, almost old-maidish in manner, and keen on comfort. He liked refinement, but was easily satisfied with his haberdashery and his home life, sought no self-improvement, wanted no adventure, showed no interest in girls. There was a hint of smug softness about him with absence of initiative and drive. His conversation was egotistical. Untoward events upset him; he was frequently travel sick, and when he was he did not minimize his symptoms, while it was characteristic that he took pains to avoid situations provocative of this and it seemed never to occur to him that the disability might be overcome. Though, as a result, he made undue demands on his family as regards the travelling involved in repeated consultations over his 8 years of irido-cyclitis, he bore the condition bravely, and when blindness was finally established at the age of 26, he accepted it with what on the whole appeared an extraordinary indifference. Certainly, he did not regard it as in any way a challenge, and he accepted without complaint a life of retirement and inactivity. His friendships had not been strong enough to prevent his handicap from terminating them, and he lost all social contacts apart from his immediate family. He learned the letters of Braille, and read one short book composed of them, but in the ensuing 10 years he never bothered further. He was persuaded to do some cane work, and to plait seats for stools; he learned to take short walks, and he did a little gardening by touch; he would occasionally visit the cinema for the sake of the dialogue, and very rarely would play the piano. Otherwise, his day consisted of dressing, sitting about the house, conversing with the family and listening to the radio, undressing and going to bed. A certain obsessiveness had been insidiously and slightly increasing for some years, especially related in the patient's mind to some financial losses, with consequent sense of insecurity, sustained by his father, but it was not until the war years that rituals became unmistakably established. He was unduly nervous of air raids and became obsessed with the fear, which he could nohow allay by visual inspection, that lights would be visible from the house after dark. He used to take elaborate precautions which only partly eased his anxiety. When, on one occasion, his precautions failed and the court imposed a fine, the anxiety became much greater. From 1940 until 1946 his security measures preoccupied him increasingly, and spread to other matters. A fear of fire prompted him to pull out the electric plugs as well as

turning off the switches, and to repeat the act 3 or 4 times for certainty. He took precautions likewise against leaving taps on, the wireless on, and the doors open. Then he would check and re-check money. Then he would have to tie his shoelaces 3 or 4 times to ensure that this was correctly done. His actions in all these directions were variable; sometimes, in blithe mood, he could manage without repetition. But when the rituals had spread to washing, repetition was invariable. Shaving would take half an hour, an hour, or more. Washing would take all the morning. On occasion he would feel obliged to take a bath which lasted entirely through the night from half-past 10 or 11 o'clock until 7 or later on the following morning. Then he developed rituals over defaecation, which was carried out with scrupulous care for cleanliness. Then he would begin to count, saying, 'One, two, three, four,' and his voice getting louder and louder with the repetitions. When asked why this was, he would say that he 'was making sure,' but he was never willing fully to discuss the thoughts that lay behind it. Finally, the greater part of the day was occupied with rituals, any efforts to shorten which would throw him into panic states with a hysterical irritability; it appeared that he gave way to the compulsions entirely and felt only small regard for the convenience of others. By the time that he came to operation, when the rituals had been present for 4 years in established form, he was living alone with a sister to whom he returned on leaving hospital. There were then a few changes to note. He worried less in general, and he no longer showed the histrionic anxiety that had been a pre-operative feature. His concern over gas and water taps was diminished, though he still went around tapping them a good deal. He was meticulous over electric plugs and switches, but repeated assurances were unnecessary. He scarcely bothered about doors. But the rituals as regards washing and defaecation, though they were accompanied by markedly less tension and excitement, were affected virtually not at all. He did not count during them so often or so loudly, but their length and the necessity for performing them were unchanged. The diminished worry had undesirable corollaries in that he was less considerate and more selfish; he now took no trouble to shave daily, though when he did he took as long as ever; he did not bother to dress at all, but pottered about the house (which he never left) in dressing-gown and pyjamas; he did not trouble in the least about punctuality and made no attempt to control his rituals even when they were most inconvenient to his sister. He made no effort to occupy himself, helped neither with the house-

work, cooking, nor washing-up, although his sister had her outside work as well. He never played the piano and seldom listened to the wireless unless someone else turned it on. Apart from a period on holiday into which he was organized with enormous trouble (and which he thoroughly enjoyed though with no expression of gratitude), he dressed only twice in the 2 years after operation: the first time at his sister's urgent entreaty for a party which she gave and for which he was 2½ hours late, the second time again at her entreaty for the writer's first post-operative visit. His fund of conversation, necessarily restricted by his blindness, became more egocentric, limited, and repetitious, while it was increasingly directed towards anecdotes which hinted at his own superior adaptation. The amazing thing was that he tolerated the emptiness of this existence with a perfect equability and good humour that only some interruption to his rituals could shake. It could be argued that that in itself showed improvement, and, taken by itself, it did. But the post-operative indolence, complacency, acceptance of things for granted, egocentricity, inconsiderateness, absence of effort, with avoidance of any steps that might make for a more hopeful future, rendered this man an almost inhuman automaton, to share whose life was utterly deadening. It is on that account that he is described as 'unimproved.' He was relieved of his tension and of certain minor rituals. To offset this gain there were minor, but undesirable personality changes, among which the lack of drive which he had always shown was especially outstanding, and was increased.

The patient who was slightly improved was CASE 109 (page 354). She too had carried out extensive washing rituals which caused her to be late, but in her these had been present for 20 years. It may be noted that while these seemed to have had a clear relation to and origin from events in early childhood, while they were clearly related to the sexual and excretory organs, while she had no objection to lovers fondling her breasts but could not abide being touched below the waistline, while she said that as far as she was concerned 'nature had made a botch of anatomy and should have arranged things nearer the top'—no amount of insight or of abreaction had made any difference; nor had the considerable, but chaste, sexual experiences which she had actually enjoyed. Here was quite another personality: a courageous, determined woman with much appetite for life and capacity for enjoyment, with high social sense, great humour, and wide interests, especially of a cultural kind. This was not merely an adequate personality, but a good one, whose principal handicap had been a drive to perfection. Such a personality, coupled

with her desperate desire to be rid of her obsessions and compulsions against which she fought determinedly, might have been thought a hopeful case. After operation she was able to cut down her bathing to once a week, when she took a bath on Sundays for from half an hour to 2 hours, still with scrupulous cleansing though she was able to do without disinfectants. Further, her repeated washing and re-washing of small clothes, which she had done every night, was reduced to a once weekly event lasting only some 4 hours. She was able, for the first time for years, to use the toilet at her place of work without revulsion. Her ideas thus dominated her less, but they were still very persistent. Visitors to her flat were a torment because she feared they would use the bathroom and contaminate it; she still tended to run past a particular public urinal holding her breath because of its associations. She was still greatly preoccupied and troubled by her fears of dirt, and found it impossible to detach herself from them. Apart from this persistence of her phobias, she suffered much loss of energy. She felt ready to drop on returning home at night, when she would go to sleep in a chair. She often did not wake until aroused by the birds or by traffic at 4 or 5 o'clock in the morning; if she did wake before that she felt too lackadaisical to go to bed. She slept heavily till 8 o'clock and failed to hear the alarm which had always previously aroused her. She still had to perform a quite extensive washing ritual each morning, though she was able to dispense with a bath, and it never took her less than 20 minutes to wash her hands which had to be followed by elaborate toilet of the nails. She thus still arrived at the office very late, though now it was because she couldn't wake up, whereas before it had been because she couldn't finish her rituals despite an early start. Corresponding with her loss of energy she had a marked loss of interest. Although she showed no loss of affect in conversation, she felt little response to outside affairs; she cared far less for her work, was not interested enough in small events of the day to amuse others by retailing them (which she had always done before), was not amused as easily, and felt bored at the theatre unless the play was one of exceptional power with personal significance to herself. Whereas she had always been keen on literature and current affairs, now she never read a book and scarcely looked at a paper. She was also much less restrained. In conversation she was garrulous and discursive in a fashion foreign to her previous self; at the office she was frankly bad-tempered to the surprise of the staff; she was outspoken in criticizing her colleagues to an extent that was embarrassing though not exactly indecorous. Intellectually, she

*found that her attention was easily distracted and that her con-*centration was poor; as she had not lost her conscientiousness she was obliged to be obsessively over-careful to offset this. This was the state of affairs at 6 months after operation. But it must be stressed that she had not had a fair chance, for she had been overtaken by two disasters. She had been rather cruelly abandoned by her lover just before operation, and had lost her favourite brother, to whom she was devoted, in distressing circumstances soon after it. In discussing the latter she certainly showed no loss of affect, and it might have been that much of her dulling was due to this cause. During the next 6 months, however, she remained much the same. She was still lacking in energy, interest, and restraint. She had abandoned reading, knew nothing of current affairs, and had had many scenes at the office. The increased leisure afforded by her comparative freedom from rituals had been utilized to some extent, but to a very limited one. Her phobias remained much the same and she had resumed use of disinfectant. Two years after operation she had not altered further, and shortly after she gave up her valuable job. She remained an attractive and essentially likeable person. Her complaint was less disabling; indeed, considering the duration and entrenchment of the symptoms and the severity of her concurrent misfortunes, the post-operative relief was considerable. But in personality and performance she was less than what she had been, while her residual symptoms still rendered her life a worry and a torment. She is, therefore, classified as only 'slightly improved.'

The case that was slightly improved differed from the foregoing ones in that the phobias were not accompanied by rituals. CASE 89 was a 32-year-old woman of middle European descent who reacted hysterically to her symptoms, in the sense that she showed a tendency to dramatize and elaborate rather than to control them, while she tended to make demands for sympathy rather than constructive efforts to solve the problem. This had led to various scenes with doctors and may have contributed to the failure of psycho-analysis. The symptoms had started in a minor way at the age of 10, had run a fluctuating course though with a steady tendency to increase, and had been grossly disabling for 12 years. The phobias were principally concerned with self-harm or self-destruction. The patient would not go out because she feared either that some harm would accidentally come to her or that she would throw herself beneath the traffic; she would

not ascend to the first floor because of an inalienable conviction that she would throw herself to the ground; she could not bear to be left alone because she dreaded some unspecified nemesis or feared she would harm herself with whatever might be at hand. These fears would come upon her apparently without regard to what she was doing, and often without regard to what she was thinking. She recognized them to be logically absurd but she could not resist them. She did not believe that she would ever harm herself, but she could not be sure; efforts to reason with herself in presence of the fears were productive of transports of anxiety, which had many somatic manifestations as well as hysterical elaborations. After operation the somatic and hysterical symptoms disappeared. The patient was able to be alone in the house without the least fear. She could go out for short distances alone without difficulty. She did not feel 'completely happy' on the first floor, but could ascend to it by herself without fuss. A rich phantasy life, which had not helped her symptoms, disappeared. She ceased to be dramatic and in perpetual turbulence, in favour of being quietly efficient. Within 6 months of operation she had married and she has led a contented domestic life since. She could usually go out in company with no fear at all; recollections of intense alarms that, on rare excursions, she had formerly felt at certain points evoked no distress. Within 12 months of operation she had travelled in a train for the first time in 10 years, and though she sat on a suitcase in the corridor for 130 miles, she thoroughly enjoyed it. This progress, however, was limited. The patient was unable to extend her activities by conscious effort, though she could do surprisingly well if she acted without thinking about it. It was noticeable also that she developed symptoms when doing what she did not like, as, for example, standing in queues. In avoidance of such she could achieve the formerly impossible, as when (she naïvely explained) she was quite able to leave her mother in the fish queue and go off alone to a café, adding, 'You see, I don't like the smell of fish and the standing.' But her performance was patchy; she was unable to sit through a film which she was watching from the balcony of a cinema, and this failure deterred her from fulfilling a promise to visit friends in a fourth-floor flat. She could not always be taken out with full confidence as to the outcome. Her range of activity

was thus small, and when alone it was very small. But when one considers the relief experienced not only by the patient herself but by those previously obliged to spend all their time looking after her, it may be said (specially in the absence of undesirable sequelae) that she was 'distinctly improved' despite her residual handicaps. She was improved to a greater extent, relatively, than the foregoing case in that such improvement as there was was effortless instead of being achieved by a dour determination, while, partly no doubt through her lack of effort, she was pre-operatively more disabled.

Substantially improved cases

The 9 cases who were very substantially improved lost the greater part of their obsessional symptoms, and were able to lead lives in which such residua were a minor feature instead of a controlling influence. To that extent the results were satisfactory in all 9 cases, yet they could not be viewed as satisfactory in all respects.

CASE 93 (see page 355), an inadequate hysterical housewife, much given to romantic phantasy, had always impulsively followed the dictates of her shallow emotions as long as they brought her immediate gain. Over-dependent on her parents, over-indulged, fearful of difficulty or competition, she contracted an unsuitable marriage in a moment of romantic enthusiasm; sexually and in every other way she was poorly adjusted, and she would not face the responsibility of children. As she tired of the marriage she became increasingly self-centred and hysterical; during the war she was uncontrolledly panicky during air raids, with development of anxious moodiness, accompanying which obsessional traits with rituals grew apace. These last were always worse when in her own home, always better when in her mother's; and out of a conflict centred round her married life there developed a major hysterical illness of psychotic intensity from which she gradually recovered apart from the obsessiveness which persisted. She was erratic and difficult for 3 years thereafter. She lost her obsessional traits almost altogether after operation, but she remained an unreliable, tiresome wife, an inefficient housekeeper, a slattern behind a façade of spurious smartness, with much capricious behaviour at home which would be resolved into entire normality whenever—on visits, at parties, or with visitors—she wished to make a good impression.

Another patient, a wretchedly inferior youth of 28 who seemed 16, repeatedly ill in one way or another, and whose life was a melancholy catalogue of inadequacies and failures, had worn out his devoted family by a long obsessional illness of some 6 years' duration, the monotony of which was relieved only by self-pitying rumination and by temper tantrums. He was basically homosexual and with a schizoid personality. After operation he showed, but only for a few days, frankly schizophrenic behaviour, which gave way to a carefree state of mind reflecting an unshakeable complacency. Nothing worried him. He continually sang and whistled regardless of its effect on others; he offended his genteel relatives by belching without apology or shame. He laughed and talked too loudly and gave himself up to pleasure. He was particular, however, over his appearance, over the spending of money, and over the maintenance and driving of his car. He airily conceded the time to do a little work in the family business, but was quite unconcerned about it, seeking neither to ensure a successful future nor to relieve an ailing father of any burden. Apart from that, he was no source of worry for he showed no excesses. He had lost his obsessional behaviour almost entirely, would get to bed in quarter of an hour whereas it had taken him hours before, and did not mind in the least when a plate of soup was spilled on one of the very suits which had previously been an object of obsessive care. He was in those ways easier to live with, but he was not a restful companion; he was a noisy, immature, coarse bumpkin who had to be borne with. This state was considered, however, far preferable to what had gone before.

Case 108 was a girl of 17, pert, superficially charming, and mixed up with the theatre, who told of her obsessions and compulsions with an amused detachment. In hospital she was airy and off-hand, always cheerful, never put out; she was unwilling to discuss her symptoms in any detail, and was evasive without the least evidence of tension. At home, however, she was continually blocking the drains with the huge quantity of paper which she used (often in addition to gloves) for protecting her hands from contamination when touching things. She would tear up journals and magazines for this purpose. She was repeatedly washing clothes, even while she was wearing them and even when they were new. She ruined innumerable garments in this fashion, as well as a handbag and some armchairs. She hacked the backs off her shoes so that she did not have to touch them when putting them on. She spent hours washing herself and her hair, and she refused to dry anything that she washed.

The bathroom was therefore always awash, and the house filled with heaps of damp material. In this way she used all the hot water and most of the soap ration. She would not mix with people for fear of contamination, detested their coming to the house, would not go to the theatre or cinema (except in a box), or walk in the district for the same reason. She would sometimes make visits to London, but would refuse to buy a rail ticket because of contamination by the booking-clerk, and would insist on paying at the other end, after which she usually washed the change. She would allow no animal in the house and no one might sit on her special chair. She was obsessed by infatuations-at-a-distance for certain actors and broadcasters who seemed entirely to preoccupy her when she was not engaged in rituals. She was always in a state of smouldering tension with her obsessional father, and when efforts were made by either parent to influence her she became rude and hostile, often with violent and deplorable scenes. As the condition got steadily worse over a period of 3 years until life in the home was unendurable and as the patient showed no sign of co-operating seriously in any form of treatment, operation was reluctantly decided upon. Her *laissez-faire* attitude was post-operatively very striking, and was considered largely responsible for the persistence of rectal incontinence for as long as a fortnight after operation. The following conversation was recorded in the hospital notes:

Q. 'How are you getting on?'
A. 'Oh, quite all right, thank you.'
Q. 'Everything fine?'
A. 'Yes.'
Q. 'Nothing at all wrong?'
A. 'Oh, no.'
Q. 'What about troubles during the day?'
A. 'I've had no troubles during the day.'
Q. 'Well, what about passing water and faeces into your clothes during the day?'
A. 'Oh yes, there was that.'
Q. 'You don't think anything of that?'
A. 'Oh, no.'

This seemed something in excess of the four freedoms, but she controlled the incontinence within a month, and by 6 months after operation she was greatly improved. She no longer washed her clothes or left damp things about She washed herself a good deal, but used only 1 tablet of soap a week instead of 1 a day. She still washed in running water but did not use up the whole supply.

She tolerated a dog in the house and would allow other people to sit in her chair. She no longer wore gloves unnecessarily, and she was not seen to use paper to avoid contamination, though it was known that she sometimes did so surreptitiously. She no longer [illegible]

out hesitation, and was not worried about contamination *en route*. It became immaterial to her where she sat in cinemas or theatres, she would handle programmes, and would drink from glasses supplied at the bar. She no longer washed money, and would accept change from tradesmen when paying them at the door. She mixed with people more easily, and even made one or two friends. She was more placid, less provocative and hostile, and easier to get on with. She showed marked lack of energy so that her pre-operative laziness was increased, but when left alone with her father for a week she had been able to keep house perfectly well. She also showed some initiative in looking for work, and she was finally accepted for training as a dancer on the stage. She was unsuccessful at this as she was a little slow and had some difficulty in assimilating intricate steps. She did not succeed, on this account, in getting a job in pantomime, and as opportunity arose of working in a dress shop she accepted it. Two years after operation she was again not quite as well. She had taken to spending between 1 and 2 hours in the bathroom each night, washed her hair daily, and washed the clothes she wore at work with care. She had some difficulty in getting off to work in the morning both through disinclination to get up and through bringing her appearance to a scrupulously high standard, while she would become upset if she touched the door on passing through it, or if her skirt trailed against a chair. She was again rather more irritable and difficult with her father (who was a grossly neurotic man), and again reluctant to visit other people or to welcome them to the house. She was, however, able to carry on with her work which she enjoyed, and at 2½ years after operation she would still visit cinemas and theatres, had some social contacts, and would go on journeys, and her phobias remained far more limited and less dominating than in her pre-operative state.

If she had been able to abandon her rituals, the result would have been very good indeed.

The same may be said of Case 104, a 49-year-old professional woman with an intense dread of cancer from which she was scarcely

ever free. The very mention of the word was enough to send her into states of panic, and even to cause her to step out of all her clothes at the first suitable opportunity, when she would leave them in a heap as they fell, souse them in disinfectants, and after a week or two would remove them with rubber gloves. If the wind blew from a certain direction she would be consumed with fear that cancer cells would be wafted towards her from a mortuary. She did not like to visit people in case they had cancer or mentioned cancer. She was afraid of being infected by books, by letters, by animals, by any contact direct or indirect. She spent pounds on disinfectants. She disinfected her clothes, especially her shoes and shoelaces, over which she took elaborate precautions. Even after her car had been aired for weeks, anyone glancing inside was almost anaesthetized by the smell of Lysol. In her house the mats and carpets, chairs and hangings, were impregnated with disinfectant; the atmosphere was suffocating, and had caused some visitors actually to be sick. She scrubbed doors and door knobs, baths and basins, wore rubber gloves to do the dusting, and was in a perpetual flurry lest some cancerous cell should somehow penetrate her barriers. Gradually these habits increased, so that whereas 15 years before, anything (the name of a place, a broadcast, a casual remark, a thought) might start the patient on anxious rumination, now such brooding would at once be followed by extensive rituals. These dislocated her life and disrupted her work. After operation she was largely indifferent to this fear. Although she was afraid that if people mentioned cancer she would fly into a panic, she did not do so in fact. She was able to walk outside whatever the direction of the wind. She rejoined the library and risked being infected by the books. She did not hesitate to open letters. She bought a dog. Not only was the number of associations that suggested cancer to her much diminished, but so was her actual fear. She still continued, however, to wash unduly, though her use of disinfectants was reduced to one-seventh of its original amount. She still wore gloves for housework. She made an excuse to put off a friend who wished to stay after an operation for mastectomy, but she went to visit her and felt no concern; she said, however, that had the friend stayed in the house it would have been necessary to send the loose covers to be cleaned. It was noticeable that she avoided opening doors by the handles and that she took hold of them at a point that no ordinary person would have used. Thus, some of the ritualistic activity remained; her ruminations, however, had stopped almost entirely, and any accompanying anxiety was negligible; where previously she had shivered and been

sick, now she remained calm. Thus was her comfort increased, and her efficiency would have been had she not shown a gross post-operative inertia. She got up late, retired early, undertook little activity except for taking holidays. She hardly bothered to resume her work, and indeed ran it at a loss. Her animated and sprightly conversation contrasted strangely with her indolence. She had always been an egocentric and aggressive woman; now she was content to retire at 50, not to bother herself, and to take money off her wealthy brother towards whom, despite or perhaps because of many obligations, she indulged a personal antipathy.

Nevertheless, if she could have lost the rituals, the gain would have been very great.

The same trend was observable in a timid, sensitive, shrinking, inadequate but egotistical woman of 41, who had shown obsessional features from the age of 10.

These had come to form a serious handicap for some 15 years before operation and had effectually prevented her from continuing her career as a trained nurse. They appeared, as in many other cases, to have arisen in connection with a psycho-sexual insecurity and to be associated with feelings of guilt. Psycho-analytic treatment of brief duration, psycho-therapy, electroplexy had all failed to make any difference. She had numerous rituals which involved washing, the use of disinfectants, and the repetition of acts 3 times to avert catastrophe. She ruminated much but against her will on 'the unforgiveable sin,' on insanity, and on the power of God. She had sudden compulsive thoughts that 'God is mad,' felt obliged to think these 3 times, and then would be overcome by guilt at such an act of blasphemy. She never spent a day without being tormented through a large part of it both by her thoughts and by the necessity for rituals. After operation these thoughts would occur to her, but they did so without distress and she was able easily to throw them off. Her rituals were reduced but still persisted, so that even 2 years after operation she was still using disinfectants. She was less concerned about them, could cut them short without getting panicky, but she could not dispense with them, and they remained a major residual symptom. She was able, during the first post-operative year, to find employment as a house-keeper, as a helper in a school kitchen, and as a companion. In the first she was not adequate, the second she didn't like, the third ended from natural causes. During the second post-operative year she resumed nursing and worked not very well for 5 months in a

sanatorium. She gave up the job because she felt tired, and has since taken to housekeeping. She is a person in whom it would be difficult to feel much confidence, however, and she cannot be said to be more than partially recovered. Here again, had she been able to dispose of her rituals as easily as she rid herself of her ruminations and compulsive thoughts, the gain would have been great.

This tendency for obsessive-compulsive thinking to be improved by operation to a greater extent than ritualistic behaviour was shown also by CASE 91, the 46-year-old Frenchman, whose pre-operative state has been described on page 356.

Doubting thoughts and ritualistic behaviour had made up almost the whole of this man's life for 8 years; on about 1 day in 10 he had managed to escape sufficiently far to be able to go out in the evening, though even then he had to perform minor rituals, would become anxious with resultant frequency of micturition which necessitated further rituals, and so was at no time free. Three months after operation his natural gaiety was marked. He made many wisecracks sometimes almost to the point of fatuousness. He was slow (in getting up, in getting to meals, in eating, in explaining things, and in movement generally), he was lazy, he was ready for bed by 9 o'clock in the evening. He read, did occupational therapy, went out for walks, but showed no special interest in anything, formed no devices for amusing himself, and made no plans for the future. He was a little untidy in dress and a little heedless in his table manners, but not enough to excite remark unless specially observed. It took him between 20 and 30 minutes to complete his morning defaecation. He was otherwise entirely free from rituals He showed no excessive washing, no obsessive doubts, no craving for repeated reassurance, no desire to make lists of things that he had to remember to do. He said that the obsessive ideas were still liable to enter his mind; but not only was he able to resist them, he no longer felt that they had compelling force. He was quite well able to look after himself. He left hospital in this state in the third post-operative month, and on return to Paris was free from compulsions. 'I would feel,' he said later, 'but this is easy, how could I [illegible]?' But when he came to [illegible] r whether they were so [illegible], and the rituals started again, though never so extensively or compellingly as before. He decided that he would not resume a life of commerce for the third time, as he feared bringing the whole illness on again, and his financial

resources, while less than they had been, were enough for a life of retirement. He was next seen rather more than a year after operation, in interesting circumstances. He was then still gay, but he stressed his disabilities and inefficiencies in a self-depreciatory way. He was a matutinal potterer; all his life reluctant to get up in the morning, he was now more so; when he did get up his rituals were brief, but he himself preferred to dally; defaecation took him up to an hour, but often less than 30 minutes; if there was anything to get up for, which he wanted to do and which excited and interested him, he could dispense with his rituals almost entirely; but he would then be uneasy later in the day, feeling that it had been unwise to neglect them, and would feel that in some way he must make up for their omission. Sudden developments of unexpected kind would also upset him and lead to insecurity with the need for rituals: bad news, political alarms, disappointments, telegrams, unexpected arrivals might do this. His obsessive doubts, too, were present: 'I feel,' he said, 'like a little child': he had difficulty in deciding things, and could not feel certain of the answers. On the other hand, detailed observation showed his performance to be better than he made out, and, when his improvement was pointed out to him, he was quick to agree. It is true that he was observed still to lock, quite illogically, his bedroom door and the side gate; but it was done without fuss. He tended also to make rapid inspection of rooms to see that all was in order. He was irked by articles being out of place. But the plain facts were that this man, who felt 'like a little child' and who a year before had been entirely paralysed by his obsessions and compulsions, had achieved much. He had scanned the advertisements for a house in the country. He had driven his car (for the first time in 9 years) skilfully and without a qualm all over France in the search. When he had found a suitable house (mansion would be a better word) he had had 3 hours in which to make up his mind; he decided to buy it, did so, and completed the negotiations himself. He had lived entirely alone in this huge and unfurnished habitation, except for a daily help, for a month and had been in no way upset. The place was dirty from disuse, the water supply was not working, the telephone was disconnected. All these might have been expected to disconcert an obsessional and anxious man. But, just as the soap rationing in Britain was a help to some of the obsessional population, the absence of baths and the temporary inevitability of draughty outside sanitation were useful in limiting further his dilatoriness and his rituals. He did not like his month, alone and in such conditions, but he put up with it perfectly well.

Further, he had been able to dispense with a personal attendant who had formerly been found to be necessary. As for his indecisiveness, he had organized engineers to arrange the water supply, he had drawn up plans for electric wiring of the house, and when an electrician unexpectedly arrived in this connection, the patient was so far from put out that he gave clear and decisive instructions in my presence. He had had a clearing made through a spinney so that a splendid view was afforded from the principal rooms. As regards his tendency to be thrown into uneasiness by unexpected events, he was very little put out by my own unexpected arrival in the middle of France at 9 o'clock in the morning, he coped adequately with the unanticipated appearance of a huge load of furniture, he was quite equable within a few minutes of receiving a telegram (which announced my arrival some 3 hours after we had already met), and met the news that the engineers found serious difficulties over the water supply without dismay. As for his needs for reassurance, he could get up, including defaecation, within 2 hours, he could bathe, eat, and defaecate without the slightest help. His lists of memoranda were small and compact, and he made them for *himself*. Finally, the ability to enjoy himself had considerably returned; he had become again a judge of food and wine, he went out shooting and shot his dinner, he fished and had pleasure in social intercourse with the peasants and in making plans for his demesne.

It is true that while under observation he was at his best in the presence of a comparative stranger who was also a friend; it is true that at times of uneasiness he still made great demands on his wife, obliging her occasionally to join in an inspection of every article in a room, or to stand by while he unnecessarily locked a door, or asking reassurance that his clothes were *correct*. But these were episodic. It is true that his inertia was great, that he would linger long over meals and could not be dislodged (once having to be left behind in a restaurant), that sometimes he would not be ready in time. It is true that he was indolent and unenterprising, and that during his month alone in a huge and empty house he had accomplished little compared with what might have been done. It is true that he was extremely irritable, spoke, as he said, 'without check,' and would sometimes—a new development—have exasperating fits of nattering which might last for hours and which were intolerable. (His wife had on one occasion absented herself for a couple of days on this account, with salutary effect; the fact that she, herself an anxious person, could do so without worry was an index of his improvement in other respects.)

He has remained much the same since: he still lacks initiative, shirks difficulties that irk him, is slow to get up and to start activity, procrastinates, lacks confidence, and is ritualistic when uneasy; there has been some improvement in his irritability. But the overall gain was immense. It was incredible that the entirely dependent man, enmeshed in doubt and ritual, who was seen before operation had turned into this landed proprietor who made plans for his property and could manage for himself.

Here again, had it been possible for the patient to lose the rituals to the extent that he had lost his obsessive doubt and rumination, he would have been all but cured.

Something similar was observed in the case of a bank clerk, who, always of obsessional personality, developed a paralysing over-scrupulousness in a setting of undue work and responsibility in anxious conditions. As a result, he would ruminate over whether he had done this or that on the way home from work, would check and re-check his work, and was unable to detach himself from his duties. He lost these tendencies after operation, coped adequately in the modified circumstances in which his bank placed him after operation, but he did not lose the established rituals, which he had developed concurrently at home over the inspection, late at night, of the fastening of doors and windows. These remained as the only residual items of obsessional behaviour.

On the other hand, CASE 99 (page 355), who had never been subject to ritualistic developments, but who had had compulsive thoughts followed by prolonged ruminations of doubt, remained entirely free from such manifestations for a period of 11 months, after which he developed further compulsive thinking, though of quite a different kind. Formerly, when he had been to visit an elderly invalid who had soon after died, he had been overpowered, against all reason and common sense, by a sense of guilt lest he had caused the death, and he had indulged in rich phantasies as to how this might have come about. If he read of a murder in the newspapers, he became convinced (though knowing it to be absurd) that he was responsible, and however he tried to disentangle himself from such a disagreeable calamity, the thoughts of it continued to recur. After operation he was troubled by nothing of the kind, and when the compulsive thinking recurred it took the form only of counting; he would secretly be doing this even in conversation, often when

alone, and invariably if he woke up at night. He would, in this way, count up to thousands, and he would do it calmly and silently so that no one could tell; but, though it distressed him very little, he was obliged to do it.

On the other hand, an intelligent but immature girl of 22, who was exceedingly intense and subject to compulsive fears which led to panic states of great severity accompanied by choreiform jerkings, gross tremors, and the tearing out of hair in handfuls, became able to lead a life outwardly within normal limits. Whereas formerly she had been unable to walk alone in open spaces, and had found it impossible to sit through such ceremonials as concerts or religious services in enclosed spaces, she became able to walk across heaths and commons, to attend church and musical performances, to ride in trains and buses, to take holidays on her own. It is true that she was not free from fears, and that at times they were inconvenient, but they were never paralysing, and when 2 years had elapsed she was still steadily employed, though in sheltered circumstances, and was able to lead an enjoyable life in which residual symptoms played small restrictive part. She had never developed rituals, and her relief of symptoms was correspondingly more complete, though when under stress certain tics continued to recur.

Recovered cases

There remain 11 cases who may be said to have lost their symptoms entirely. If at this point we indulge in over-scrupulousness ourselves, we might mention that 1 of them did entertain an occasional compulsive thought of blasphemous kind which entered her mind now and then against her will; but it neither caused her distress nor influenced her behaviour, and she led a normal life. It was inevitable also that some of the patients should be reminded, through obvious associations, of things which they had previously thought, and which then had led them to obsessive behaviour, but such thoughts did not post-operatively prompt the patient to any activity beyond a mild wonder that such things could formerly have caused distress. In none of these 11 cases did such traces cause even inconvenience.

There is at once a question to be answered: Why did these 11 patients lose their symptoms when the others did not? The answer to this does not lie wholly in the length of time over which the symptoms had been experienced. For 1 of the

patients who became free from symptoms had experienced them for more than 20 years, and others for more than 10 years, while some of those who did not become symptom free had shown obsessional behaviour for much shorter periods of time. Nor did the severity of the symptoms account satisfactorily for the difference; nor did the psycho-dynamics. It seemed, on the other hand, that the form which the symptoms took did seem to be of consequence, and here again our attention is drawn to the rituals. It cannot be said that all these 11 patients who lost their symptoms were pre-operatively free from rituals; that was not so. Five of them were preoccupied with cleanliness and a sixth with tidiness, and all those 6 were ritualistic to some extent. But if we take the whole group of 23 surviving patients we find that there were 7 without rituals, and an eighth who had scarcely any: of those 8, 6 lost their symptoms entirely, and 2 were very markedly improved. On the other hand, of the 15 patients who did show rituals, 6 lost their symptoms entirely, 1 was virtually unchanged, and the others showed varying degrees of improvement. This is in itself suggestive. But if we examine the matter further, another point arises, so simple as to seem, perhaps, hardly worth being stated. Yet it may form a guide to prognosis for treatment by operation. That is, that it was in those cases where the rituals had become so established as to be automatic that they stubbornly persisted. It may be said that this is only to be expected, as showing the deeper entrenchment of the condition in the patient's constitution; so it may be, but it is not dependent, as might also be expected, on time alone. Where the rituals were not inexorably followed day by day, where they could sometimes be cast off, where they were influenced notably by the mood and through that by external circumstances, where they were influenced by external circumstances directly, where they changed in pattern (even with the substitution of new ones), and where such activities of the patient were thus seen to fluctuate, either in kind or in degree, there was the outcome the more satisfactory. Even Case 106, who could sometimes dodge his minor rituals when in blither mood, but whose habits of washing became invariable and entrenched, lost the former but not the latter (page 360), and the same is true of the others.

If we examine the matter in other ways, the figures in this

group do not help us. For example, it was evident that behind such activities there lay different attitudes; in some cases the rituals seemed to have been evolved from sheer panic; in others they developed more as the result of a positive attitude—a drive to perfection; in some cases the patients resisted and drove themselves to the limit of their capacity; in others they acquiesced more readily in their compulsions; in others they dodged provocative situations as far as they were able. It is possible that resistance, like acquiescence, served only to entrench the rituals further by increasing the compulsion to perform them. But whatever the underlying pre-operative attitudes of the patients, such seemed to be unrelated—in this group—to the final outcome as regards the symptoms. The only decisive factor that could be discerned was the entrenchment and standardization of the rituals. Where these were a routine, they were not post-operatively shaken off. Where there was variability there was hope.

To say that is not to alter what we have seen to happen often enough to form a general rule: that the better the personality the more satisfactory, on the whole, is the operative outcome. That still holds in this group. But as regards the improvement in the actual symptoms themselves, it would seem that the more entrenched and standardized the rituals, the more they were carried out as a routine, and the less they were influenced by moods or by outside events, the less favourable was the outcome as regards their removal.

On the other hand, compulsive thoughts and vacillation due to obsessive thinking yielded much more readily to operative treatment. The following is an example.

CASE 97. A man of 29, with a good work record and a personality which endeared him to others and enabled him to lead a happy married life despite his symptoms, had a history of obsessional thinking from about the age of 17. He was then a sensitive boy of pyknic habitus, and was much wounded when a girl of whom he was fond took to calling him 'Fatty.' He was, in fact, obese, and he resolved to slim, with which end in view he severely limited his diet and took excessively to bicycling. He began to feel less well and below his normal strength Lay discussion implanted in him the notion that he was anaemic. Obsessive doubt then seized him; if he

ate little he wondered if he were harming himself, if he ate plenty he feared that he would regain weight (as he did) with deleterious effect. He became hypochondriacally preoccupied in many ways though he recognized that there was absurdity in his fears and refrained from acting upon them; he stayed away from doctors on account of what he felt to be the inherent nonsense of his ideas. He then started to ruminate on what were the things in himself that had started him on such a course of thinking; he studied the problem from all angles, and the further he pursued it, the more involved and perplexed he became. Then he began to wonder whether, in course of these reflections, he had remembered his past aright. This led to wondering whether his memory was faulty, and that led to doubting that his reason was intact. The impossibility of detaching himself from these ruminations, and the absurdity of much of them, led to the suggestion of impending insanity, and then he was unable to detach himself from the fear of going mad. His confidence was in this way so undermined, enhancing inferiority feelings that he had always had, that he became doubtful of everything. Like CASE 91 (page 356) he would be doubtful if he were correctly dressed; like CASE 94 (page 354) he would, though looking at the clock, be doubtful if he had rightly read the time; if he put his glasses on the edge of the table he would be doubtful, though recognizing that he was irrational, that they might not fall off; he became afraid to go out lest he could not remember the way, afraid to throw a cigarette-end away lest it do some damage, afraid to buy things lest he gave the wrong money or got the wrong change. When a doctor whom he finally consulted told him it was 'just a case of nerves,' he studied the phrase so long that he found a dozen meanings in it; when another told him 'not to study things so much' he became afraid to look at anything for more than half a second. 'Everything I think—and it runs into millions—worries me. I've always tried to worry it out and to show I'm not going insane. The effort makes my head split. It's not really a headache, though, it's all of a whirl inside and I can't think properly. . . .' '. . . if I've had a bit of a row and feel "I don't care, blow it, I don't care what happens to me," for half an hour I'm able to relax then, but it comes back again. . . .' He had carried on steadily at his work (as a moulder in a foundry), where he was highly thought of, until 2½ years before operation, during which his attendance had been variable; his longest continuous spell of employment during that 2½ years was 5 months, and for 6 months before operation he had not been able to work. 'He'd be all right,' said his wife, 'if he had written

instructions for everything, but without those he gets too doubtful to do anything at all. . . .' Electroplexy had made no difference to this condition: psycho-analysis, to which he had finally been driven, had had a small and temporary palliative effect. After operation his doubts completely disappeared; he was decisive; he required no reassurance; he did not worry; he returned to work. Two years after operation he remained symptom free.

The case is an example of the relief afforded by operation to patients with compulsive thoughts and with vacillation and doubt arising from obsessional thinking. The following are examples of cases with behaviour which might be called ritualistic, but which showed some variation both in the form and frequency of the rituals, and in the intensity of the compulsion which led to their performance.

CASE 103. A woman of 30, single but who had for some time been living with the man whom, post-operatively, she married, had been morbidly sensitive since being involved in childhood in a motor accident which had left her with a tibial deformity. The home life was unhappy: the father was erratic in his hours, temperament, and love life; the mother was over-busy running a boarding-house, in one room of which the whole family lived together; turbulent scenes which developed in this confined space led the patient and her brother to escape as much as possible. Though she identified herself to a considerable extent with her obsessional mother, the patient became an ill-assorted miscellany of aggressiveness and timidity, submissiveness and rebellion, affection and aloofness, irritability and tolerance, over-cautiousness and readiness to take a chance. Though she had marked inferiority feelings and an inclination to retreat from difficulty, the keynotes of her character became over-conscientiousness and a certain tenacious courage; these combined to drive her beyond her strength. At first her obsessive tendencies were mainly apparent in over-scrupulousness at work and in hypochondriacal preoccupations. By the time she was 20, and courted by a man of whom she was very fond, her concern over health had become severe, especially when she learned that her lover had at one time had tuberculosis. Added to this were obsessive doubts as to whether she should marry him, remorseful ruminations over the sin of pre-marital relations, and the burden of incipient ritualistic behaviour which had begun in a setting of pressure of her exacting work. Everything in her office had to be straight (pencils, files, paper), and so, to some extent, did things at home also. A

change of job which she could not avoid was unhelpful, as it involved meticulously accurate work with statistics which further increased her need for precision. As a result, she became so restless and irritable that she felt herself unfit for marriage. Demoralized by this, she yielded to her fiancé's persuasions to live with him without a formal alliance, but the deception and feelings of guilt that such an arrangement involved helped to maintain her tension, and, through that, her obsessional behaviour. She began to do many things over and over again, washing clothes and vegetables, making sure the lights were out, repeatedly looking to see if the food was cooking, and putting the creases straight in the curtains. An abortion did nothing to improve these symptoms, but a change of job (for she worked long hours as well as keeping house) to something less exacting reduced her tension and with it her obsessiveness. A melancholy bereavement, however, brought about an exacerbation, and the patient desperately decided that she must give up doing housework in addition to her job, and that she must resolve her obsessional doubts over marriage. This she tried to do by leaving her lover and the district, getting employment elsewhere, and returning to live with her mother. She then felt exceedingly frustrated, felt vicious towards life, hated to see anyone happy, and became aggressive, irritable, and self-assertive. This frustration, coupled with the fact that her new job turned out also to be most exacting, caused a further increase in her symptoms, and work became impossible for 3 years before operation. When sending a parcel she would pack and re-pack it; when writing, if she failed to dot an 'i' or cross a 't' she would write the whole letter again. She became introspective and depressed; long attendance at a psychiatric out-patient department and a course of electroplexy made no difference; she was slightly improved by a spell in hospital, where she had further electroplexy and modified insulin, as well as psycho-therapy. But life became intolerable when her return home was followed by that of her erratic father with whom she had violent clashes when he blustered at and bullied her. She could not give away a diary (which she had bought as a present) because one of the pages was dog-eared, and she was obliged to keep it and buy another. She could not sew or knit because every stitch had to be perfect. She had to go on combing her hair until she felt the comb to run with perfect smoothness. She had to do the washing up again and again until she felt that she had in no way dragged or caught the dish-cloth. When given dirty coins she had to polish them, and if they were bent she could not pass them on. She eventually developed a technique of dis-

posing of these by giving them to bus conductors with great suddenness so that there was not time for her to snatch them back; but before doing so she had to study and memorize the dates they bore. She began to be obsessed also by numbers, and had to do things 3, 5, or 7 times over, then after a few weeks 4, 5, or 7 times over. This increasing tyranny of numbers she viewed with alarm. Somatic symptoms of anxiety then began to appear. Her hands and feet became clammy, and at times would stream with perspiration. Her eyesight would be blurred till she imagined there must be foreign bodies in her eyes. She became constantly conscious of her heart-beat, and of a constriction in the throat which she repeatedly tried to clear. If her articulation were imperfect, she would have to repeat what she had said, and if there were any suggestion of spitting when she spoke, she was obliged to clear her throat until she felt that she had done so perfectly, and then to enunciate each word again with perfect elocution. At the same time, she developed extensive itching of a transient but recurrent kind; if she started to itch she felt that she must do nothing until she had stopped itching, as the latter might in some way mar a perfect performance; if the itching started when she was already doing something she felt obliged to prolong that activity until the itching stopped. If she itched as she was starting to sit down, she had to keep on getting up and sitting down again, and it was the same if she felt that she had not sat down perfectly. The habit then spread to other forms of interruption; if she were writing a letter and heard some adventitious noise (someone turning on a tap, or the passing of some traffic) she would have to wait until the noise had stopped before she could continue, when aircraft provoked her in this way, she would remark irritably, 'I hope it crashes,' and would later be troubled by remorseful rumination; likewise, if the neighbours turned on their wireless, she could do nothing until they had turned it off; if she herself turned on her wireless she was unable to turn it off in the middle of a sentence or a song, and sometimes had to endure the martyrdom of waiting until the programme had finished; then, if she were itching she could not complete the act of turning off the set, but would stand there, turning it on and off again until her itching stopped; she would do the same with the electric lights, and she would have to dress and undress repeatedly. She astonished her fiancé by the inexplicable fervour of her adieux, since, if she felt she had not kissed him perfectly, she had to repeat the act again and again, the reason for which he did not understand. She thus had a thousand rituals, extending into every activity from the eating of

meals to the adjustment and disposal of sanitary towels. The height of this tyranny was perhaps reached when, allowed out on her second admission to hospital, she felt that she had not made a perfect return journey owing to a slight disarrangement of her hair. After 2 days of struggle she gave in to the compulsion; having again got leave, she re-packed the bag she had taken on the previous journey with the same contents arranged as nearly as possible in the same way; haunted by the fear that some imperfection would necessitate another repetition, she set out; when she met one of the doctors *en route*, she jauntily pretended that she was doing local shopping, rather than confess the true absurdity of the act. She completed the journey of 11 miles each way, fortunately in impeccable style. But when an operation was proposed she wanted it postponed for a month in order that she might have another menstrual period, for the slightly imperfect arrangement of a sanitary towel had prevented her life from reaching that level of perfection at which alone all omens for leucotomy could be good ones. Reality intruded, however, when she realized that in a month hundreds of other imperfections might arise, each of which would cause the operation to be postponed to an indefinite infinity.

This last fact, perhaps, is an indication that the rituals had not become so automatic or out of hand as to be entirely beyond her control, and there are other points about them to be noted. She did not necessarily have to perform each one each day; they varied according to what she noticed and didn't notice; they were not independent of outside circumstances; not only were they varied in form, but one could be exchanged for another, and when one was completed there was a measure of absolution from others; it was as though by the successful enactment of one ritual she had made a sufficient act of expiation, for the time being, to be absolved from immediately carrying out another. In this way, it is possible that their very multiplicity was a factor in preventing any one of them from becoming entirely automatic and entrenched.

After operation the patient was dull, unspontaneous, and lethargic. When she wrote her first post-operative letter she tried to write it perfectly, but it was almost her last perfectionistic act in more than 2 years since operation. Within 3 months she was considered by her relatives to be normal. Within 4 months she had married the man over whom she had hesitated for 10 years, and she has since had no regrets. Within 6 months, not only was she keeping house and keeping it efficiently, but she had been examined and passed for, and had started, a government course in shorthand and

typing. She rose at 7 o'clock, dressed without difficulty, applied her make-up (which had been previously impossible), got the breakfast, did some chores, and arrived at her secretarial school by 9.30. She worked there till a quarter to five, shopped on the way home, prepared the evening meal, did the cleaning, and then ate supper with her husband, after which they would either visit friends or the cinema, or they would sit at home, where they would listen to the wireless, or would sit and talk while the patient knitted or sewed. She did the mending, had made herself some clothes, and had knitted a jumper and a pair of gloves. (She had been unable either to knit or sew for 3 years before the operation.) She went to bed at various times, according to what they were doing, but usually at about 11 o'clock, which was earlier than her previous normal. She undressed without hesitation or ritual. She denied compulsions, obsessive ruminations, or recurrent fears. She said that not only was she quite unconcerned by such things, but that she did not experience them at all. She did not have to wash things, to fold them, to memorize items, or to repeat actions, and she said that even the thought of such things had not occurred to her except at such times as she had deliberately reflected on what she used to be like. There was no itching and there were no somatic symptoms. Her husband, an intelligent man, confirmed this. In fact, when asked if he noticed anything wrong with her at all, he was reduced to saying hesitantly: 'Well, let me see. . . .' And finally he decided that she became abnormally tired by late evening, that she sat in the arm-chair rather more than she used to and more than a normal person would, and that she was not as active as she had been when well; on some discussion, it emerged also that she was not quite as animated and lively as he remembered her when at her best, and that, never with many interests, she was slightly less interested and attentive than he remembered her when well. He stressed, however, that she was more active, animated, and interested than she had been for several years. He also stated, what she had not, that when she was tired at the end of the day there was sometimes just discernible 'that tendency to arrange things a little. It's when she gets tired you

smoothing the ends and straightening them just so. But it's really nothing. It's nothing like what her mother is now: she's one of those women you can hardly dare breathe anywhere, everything's got to be just so.'

As regards personality changes, he noted none beyond the slight

lack of interest and animation, 'she's not quite so gay as I'd like to see her be,' and he was convinced that she showed no intellectual deterioration. The patient, on the other hand, said that she was more outspoken in the sense of being better able to stand up for herself, and she gave convincing examples. The reason that this had not struck the husband was twofold. (1) The patient had always been liable to vent her subdued aggressiveness on him to some extent; now that she was on better terms with the world she had less need to do so. (2) On the other hand, she had always been timid with people other than him, although, since she had striven to conceal it, the efforts needed to overcome it had been greater than were outwardly apparent; post-operatively there was much less need for effort, which was apparent to her but not to the outside observer. Allied to this, she was much less self-conscious, of which she gave incontrovertible evidence. For not only was she sufficiently oblivious of her tibial deformity to have been able to discard her habit of wearing thick stockings, but, having sustained a chip fracture of the malleolus of that very bone, she had been examined before other patients and students at a teaching hospital without a trace of embarrassment. (Pre-operatively she had always concealed her leg as far as possible, behind chair legs, or behind her sound leg, and had shown the greatest reluctance before submitting to examination.)

To the outside observer she was markedly different. She was, of course, less serious and constrained than when seen with all her pre-operative tension; not only was she less obsessional in her talk, but she was now garrulous almost to the point of facility, with something of a tendency to giggle. She talked, however, sensibly and well. There were some curiosities in her sensorial tests. Though she could reverse 7 digits she had far more difficulty in doing so than before; when asked serially to subtract 8 from 109, she said, 101, 193, 186, 179, 171, 163, 155, 147, 139, 131, 123, 117, 9, 1; and though she did serial subtractions of 7 correctly, when asked again serially to subtract 8 from 109, she did it almost exactly as before. (Pre-operatively she had made no mistakes.) When asked to recall a name, address, and flower, given her a few minutes before, it took her quite half a minute to realize what was required, though she then recalled them rightly. In a person of her intelligence, these were anomalous findings suggestive of some intellectual change, although such was recognized neither by her husband nor by herself. Such was further suggested, however, by the later information that, try as she might, she had never managed to achieve more than 60 words a minute at shorthand, which was comparatively far below her

performance in the other branches of the course that she took after operation.

By 12 months after operation the patient had had a child, appeared radiantly well, and was without any trace of recurrence of her symptoms. She was normally restrained in conversation, talked forthrightly and to the point, did not appear in the least facile, and was without tendency to giggle. She led a life essentially within normal limits. She now did sensorial tests without mistake, but was able to reverse only 6 digits. She appeared a normal and pleasant [illegible]

[illegible] tion was perfectly apparent at a glance; the very unsatisfactory nature of the landlady was confirmed by the husband, who said that although the patient was liable to lose almost all self-control when provoked, there was much justification, and she was no worse in this regard than she had been ever since he had known her. Rather more than 12 months after operation, when the landlady had succeeded in driving her almost to distraction by the exercise of petty meannesses and frustrations, the patient had a small recurrence of compulsive behaviour to the extent of having again to arrange things precisely and sometimes to repeat her actions. But this did not reach serious proportions, and, with a happier arrangement of housing conditions, she remains again symptom free at a distance of 2 years and 5 months after operation.

The net gain in this case, at the cost of negligible personality changes and intellectual deficits of an elusive and apparently unimportant kind, was enormous. It was striking that, in so far as there was any recurrence over a short period, this was of a ritualistic nature only, and did not involve obsessional preoccupation. It is again stressed that the probable reason why this patient was able to lose her rituals, despite a tendency for them post-operatively to persist in the group as a whole, was that they were of various sorts, with an intensity of compulsion that varied according to circumstances, so that one ritual would displace another and none of them had become so automatic and entrenched as to have become a routine performance undertaken independently of outside events.

The last case that we will quote illustrates much the same thing.

CASE 90. A housewife of 41, whose childhood, bandied about at the instigation of a drunken and licentious widowed father

among unsympathetic aunts and invalid grandparents with many changes of home, was not conducive to the formation of stable patterns of behaviour, had wet herself and sucked her thumb until the age of puberty. The libidinous remarks and lewd behaviour of a 'stepmother' then contributed to the development in the patient of a psycho-sexual insecurity which was reinforced by the appearance, almost simultaneously, of her first menstrual period, for which she was quite unprepared and of which she was able only partly to assimilate the clumsy and distastefully presented explanation. Though timid, downtrodden, and unconfident, she was not without courage, and after working steadily in a factory from leaving school until 23, she married a steady and admirable husband. Their sexual relations were always difficult, unsatisfactory, and—for the patient—accompanied by feelings of distaste, degradation, and guilt. These were not allayed by the practice of coitus interruptus, after which, the patient said, she would actually hate her husband, would be irritable and brusque, and sometimes would not speak to him at all for as long as 3 days. She had a daughter at 24, and 7 years later she had twins who died at birth. As, in a state of muddled conflict over the whole question of reproduction, she grieved over these, she was advised to have another child, which was born when she was 32. At 34 she again became pregnant, but unintentionally; for various reasons (mainly of a psychiatric nature) she was advised to have an abortion, and this was duly done. It enhanced her feelings of guilt and exacerbated her conflict. In the meantime, when the younger surviving child had been but a few months old, the elder one had had scarlet fever; and the patient who was inclined both to love and reject, in ambivalent fashion, the children who had caused her much muddled mental anguish, entered a flurry of anxiety on their behalf. Her feelings of rejection were dutifully submerged under a flood of solicitous activity. The importance of preventing spread of the infection having been impressed upon her, asepsis became the central theme of her life. Always over-conscientious, and with a neurotic dread of failing to take all precautions, she became desperately worried, till all dirt was anathema. At that time there was a plague of snails in her small back garden, and these left many slimy and offensive tracks, on which the patient anxiously avoided treading. But she could not be sure of that, and she began to wonder in a ruminative way if she might not have been responsible, through some such carelessness unrecognized at the time, for various illnesses which the elder child had sustained. She began to dread not only the snails but anything which crept on the ground, and when she

found a beetle in the linen-cupboard, she laundered everything that had been stored there. A caterpillar in a lettuce then threw her into a state of agitation, and it was but a step from that to refusing to have any vegetables, and then any flowers, inside the house. This was partly overcome by the kindness of neighbours in washing them for her first, but the greengrocery side of her husband's business had to be given up. She had to avoid people who carried vegetables or flowers or [illegible]
she would [illegible]
might hav [illegible]
sit next to strangers in the cinema because she feared they might have been so engaged, or that they might have been working or sitting in their gardens; and when she returned from the cinema she would always brush her coat. Many things to which she had felt antipathy as a child were woven into these themes, and conflicts dating from early life were similarly expressed. These habits persisted, of course, for years after the elder child's recovery from that scarlet fever which had brought out the patient's obsessive tendency, and the fact that the younger child had developed no infection had done little to allay the symptoms. On the other hand, many small incidents had exacerbated them, such as finding a rat in the pantry or a cobweb in the doorway. The children were discouraged from playing in the garden, and were made to wash if they had touched the floor, while any interest they showed in insects struck terror to her heart. In reaction to such events the patient would often sponge the house down, and would wash her hands repeatedly. Her ideas of contamination spread to include money, and she was then unable to help her husband in his shop, so that he could never leave her in charge and go away himself. Always tenacious of ideas and, despite her sense of inferiority, obstinate and rigid, she never lost her phobias during the 9 years of illness. There were, however, fluctuations in their intensity, and the rituals fluctuated *pari passu*. There was one ritual, however, which was almost invariable, was independent of circumstances, and which seemed to be carried out as an automatic act regardless of precipitating factors This was the secure shutting of the bedroom door, which would be repeated again and again. There were occasional times when she was better, as when she was partly able to enjoy the first real holiday of her life; she had chosen Bournemouth because, she said, 'the sands are washed there every day.' And in the sheltered environment of hospital she had had days in which she had felt almost well, and had been able to touch and even to arrange flowers in the vases. But most of

the time she was tense, irritable, anxious, and self-pitying. Then, in particular, the rituals were worse, almost always in relation to some association of ideas or trivial but untoward event which had raised her tension. She deplored her own helplessness, she despised herself for fussing and nagging at the children, she knew that she was spoiling their lives, but she could not help it, and felt that she would be better out of the way. Thus, she had spent a large part of the time withdrawn and in bed, while she brooded on suicide and was intermittently depressed as a reaction to her symptoms. She was admitted to hospital 7 times in all, once as a certified patient when agitation and hopelessness of recovery had overpowered her. When seen 4 months after operation she said: 'Oh, I'm very well, very lazy but happy. Oh, I'm awfully lazy, I don't do anything. Well, I usually get up between 10 and 11, do nothing much for the rest of the day. Just glance through the paper, you know, but I can't read a book, I turn over a page and turn back again, I can't settle. Well, yes, I am restless. I'm all right if I can sit here, but if Helen wants me to do anything, I show off a bit. Well, sometimes we get nasty with each other, a bit nasty, if she's annoyed with me. We have dinner about 1. Helen gets that. I just help with the washing up, you know. I don't know what I'm going to do next month: Helen's due to go off nursing. In the afternoon sometimes I do a bit of mending, but I usually sit about, just do the mending when I feel I can do it. If I don't want to do it I leave it. Before, I'd always do it on Sunday and it'd worry me if I hadn't done it. I'd never have thought of putting my laundry away unmended. Now I don't mind. Then tea about 4.30. Then I sit back, sit and talk or listen to the wireless. I don't go out as much as I ought to, I don't feel like it. I go out once or twice a week, something like that. I sometimes do the shopping. Oh, yes, I've been to the greengrocer's. No, I wasn't upset at all. The ideas are still there, but not all that annoying really. If Dick sits on the floor I sit and think about it, but it doesn't worry me like it used. At one time if I'd seen him to that I'd've been crying away at once. Now I don't stop him from doing it. I don't mind. If we go to the pictures and see anything a bit, well, a bit annoying—there was one of a man with a lot of creepy things, things they were catching out of the water—I turn my head away. No, I don't mind who I sit next to there, and I don't mind going on buses. I don't have to brush my clothes when I get back, and I don't wash unduly. And I don't really mind if things are just so or not. Yes, I go out in the dark too . . . that's no bother. . . .' Then she added: 'There's just one thing. I do like

to have that bedroom door shut at night. Oh, no, not like I did. I think once I spent 2 to 3 hours on that door, shutting it and making sure. Now I just shut it and lean on it to make sure it's shut.'

The daughter confirmed the description of indolence which the patient herself had given. 'My goodness,' she said, 'she does want a bit of getting after.' The patient herself had said, apropos of her reduction in washing, 'Probably if I gave way to myself and Helen wasn't here, I might get a bit grubby in some ways.'

This might seem a discouraging total picture, but the husband said: 'Oh, life's a pleasure now. When you've had 9 years of that you feel the benefit of this. . . . As regards the obsessions she still has the memory of them, just the memory. Before, as soon as we were home we'd probably have to be brushed. That's all gone. When I made the fire up everything had to be cleaned out of the way, I had to wash my hands and not touch anything. She doesn't bother at all now. But she's very dilatory. The only difficulty with her is if you want her to do anything. If she doesn't want to she'll swear at you. She's always used some bad language, when she was young she was brought up rough. But there's no nasty meaning behind it, it's just a figure of speech, it's very quickly over, she bears no malice. . . .' He confirmed the patient's own account of herself, specially as regards her ability to go anywhere without fear, her freedom from ritual, her indolence, and her fatigability. He added the facts that, while she was not so easily roused to irritability as before, she was more outspoken when she was roused, she was more placidly obstinate, that she would have smoked incessantly if she had not been rationed, that she was too easy-going to bother herself about such things as news, and that she showed no signs of offering to help him in the shop. But she was loving, affectionate, and easy to get on with, though she still eschewed sexual intercourse.

Seen at 12 months after operation the patient was quite different. She was nimble and alert. She said, 'Well, Helen's had to go to school to study for nursing, so now I just have to take what comes. I find I soon get tired, but after a bit of a rest I'm all right again. You know, it's a year to the day since I had the operation, and I feel better than I have ever since I got married, and that's 19 years. Those last years were dreadful. Yes, looking back on it, I used to get so depressed. I used to cry for hours; mind you, it was always something that happened that made me, if I had a lot of washing to do, or if Tom or Dick dropped something on the floor and got me worried about dirt, that'd make me upset. I never thought I'd

be able to take to a cat, but we've got one now. Oh, yes, that sitting about's all gone. Mind you, I still could if I let myself, that's why I've taken up knitting, so that if I sit I've still got something to do. Well, I must say I don't get up very early, 9 or half-past, but I get up soon enough so that I can get through the work, and I keep the house clean. . . .' There was no doubt that she did. Though still fatigable, she kept house efficiently and did the shopping. She had suggested and helped to execute many improvements about the home. She had arranged for the attendance of decorators and had chosen the new decorations. She was none the less reasonable in her expenditure and able to keep account of it. She was now more restrained, used bad language no more than she had ever done, was hardly ever irritable though obstinate as she had always been, was thoroughly agreeable, thoughtful, and considerate, and had controlled her appetite for cigarettes so that she smoked only 6 a day without being rationed. Apart from her duties, she was able to enjoy herself. She was never gloomy and had not cried since the operation. She went 10 miles each way every fortnight to see some relatives, who reciprocated the visits. She had friends in to tea; 'before, the thought of them coming would have scared me stiff.' She went to the cinema once a week on her own as a rule, and each Wednesday with her husband; 'before,' said her husband, and she agreed, 'it was horrible to go out and horrible to come back, now it's a pleasure to do either.' She did not show an abnormal placidity, but had plenty of interest and feeling. She had no residual symptoms. 'She is quite normal,' said her husband, 'in every way.' Yet that was not so, and he exaggerated. For she still had some deficit in her powers of restraint, so that remarks slipped out of her mouth before she knew it; this habit did not make her in the least offensive, yet her husband knew well that she was not as tactful as she had been. Also, she still became unduly tired, and she got up much later and went to bed earlier than had been her wont, while her interest in the shop had never returned, and she would not help him in it. Intellectually, too, she was not quite the same; she attended less to current events, and though she could describe films and plays intelligently, she seemed to have some deficiency of grasp which she could not herself analyse and which was too recondite to be elicited by simple tests. This was suggested by the facts that, despite her freedom from distressing preoccupations, she could not reverse digits as well as before; she could not, though she tried, read a novel, though she could digest short stories; anything longer she found that she 'couldn't concentrate, somehow couldn't take it in.'

Nor was this due to boredom. The same was true of knitting complicated patterns. '*I can't* do them, I don't know why. I want to, but my mind won't settle down on to doing it, it must be somewhere else sort of thing, not that I'm worried but my mind won't sort of settle. I don't know what I think about instead, nothing special, just anything that comes into my mind. But I can't do the patterns if they're difficult.' And when she did serve in the shop for a while, to allow her husband to talk in confidence, it was noteworthy that she said afterwards that she had had difficulty; she could not find the stock she wanted, though it had been kept in the same place for years and when it was pointed out to her she remembered at once; she confused the prices of articles although they were quite different and she had been told them only a few days before; and her husband admitted, 'Somehow, she doesn't seem able to grasp it.'

Notwithstanding these elusive intellectual deficits, in spite of her being less tactfully adroit, and taking into account her fatigability, there was in this case a huge net gain. Her state at 2 years after operation has not been personally investigated. But there is no reason to suppose that there has been any hint of relapse, and she is stated to be thoroughly well. It is noteworthy also that, when last seen, she had successfully withstood without recurrence of symptoms, the death of her father-in-law in her own house after a distressing terminal illness.

In this case it is again stressed that the probable reason why this patient, in contrast to others, was able to lose her rituals is that they occurred as a reaction to outside events, that they were thus varied in form and variable in frequency of performance, and that they were not so deeply entrenched as to have become autonomous and automatic.

Conclusions

We have now considered our 24 patients who were operated on essentially for the obsessional symptoms themselves. We have seen that the operation can by no means be reckoned as a cure, although as a result of it 22 of the 24 patients were better than they had been for many years, while, apart from 1 death, none of them was worse. One (Case 106, page 360) was virtually unchanged, 1 (Case 109, page 363) was slightly improved, 1

(CASE 89, page 365) distinctly improved, 9 (pages 367–377) very substantially improved, while 11 (among them CASES 90, 97, and 103, pages 379–393) lost their symptoms altogether. On the whole the personality changes were small; they were small enough, in 20 out of the 23 survivors, to be of no consequence at all when compared with the gains secured by relief of symptoms; and that was true not only for the patients themselves, but also of the relief afforded to the relatives. Even in the other 3 cases the personality changes were not very great; they were exaggerations of traits which the patients had always shown: heightened and more readily expressed dissatisfaction and irritability in CASE 109 (page 363) which led to an undesirable change of job, in a setting of only moderate relief of symptoms with superadded environmental difficulties; of an increased selfishness and demanding egocentricity leading to a refusal to resume work in favour of sponging on a brother who could, in fact, afford the money in CASE 104 (page 370); and of increased egocentricity and *laissez-faire* in a blind man already without interests beyond the insurance of his own comfort, in CASE 106 (page 360). Even in these 3 cases the personality changes were such that they assume prominence only when not considered in relation to the degree of symptomatic relief obtained.

The fact that the personality changes were so small when compared with the gains achieved by operation is not to say, however, that they were unnoticeable. There were undesirable changes, apart from those in the 3 cases just cited, in 8 other cases. In 2 of them this amounted only to a certain indolence, mainly as regards failing to get the husband's breakfast in the morning, though this seemed to cause no grievance. In 2 of them there was troublesome irritability with some lack of sensibility for the feelings of the wife. In 1 there was more than that, in the form of sudden frightening rages, provoked by criticism, involving banging on the table in alarming fashion; but there was never violence, the episodes were short-lived and followed in a minute or two by acts of atonement, while they did not occur more often than, perhaps, twice a month. In the other 3 there were different degrees of the same essential change, which was a sort of complacent selfishness, with taking things for granted

and thoughtlessness for others; this was a nuisance in the home in only 1 of the cases, and even so was nothing compared with what had gone before; in another of the cases it was noticeable but no source of trouble in the home; in the third it appeared only at work, where the patient abandoned the welfare activities in which he had formerly been interested, and although attached to and under great obligations to his employer, quite suddenly gave notice without a word of explanation as a result of a rather small disagreement which he shared with some workmates against a foreman; it was interesting to compare his insouciant attitude ('I don't think I should have really done it, but there it is') with his previously paralysing obsessional hesitation, as well as with his wife's sense of ethical shock at such flouting of his obligations (CASE 97, page 379).

The fact that attention has been drawn to personality changes in only 11 out of the 23 surviving cases must not be taken to mean that there were no abnormalities in the remaining 12, for there were. But they had been abnormal persons for so long and in such various ways, and the operation, while it may modify or release whatever may be present, cannot be expected to create *de novo* a constitution with fresh ingredients. Some had residual symptoms of an obsessive sort, and some had residual peculiarities that they had always had. In these there were post-operative modifications which did not, in the total picture, assume any significant importance.

Then there were intellectual changes, admittedly of an elusive kind, not demonstrable by simple tests, but of which one saw hints when the patient was viewed against the life situation. As it happened, however, it did not appear that these were of real consequence to these patients, especially when the pre-operative state is weighed against the post-operative results; but such changes might have been of consequence in people whose work was of a higher intellectual range. Even so, when the pre-operative condition is as paralysing as in this group, and as resistant to treatment and with as poor a prognosis, operation would still seem a course of action which has much to commend it even in an intellectual worker.

As regards restoration of efficiency, as opposed to relief from

symptoms or development of personality and intellectual changes, the following are the facts:

Patients unemployable for more than 8 years before operation: 5.
Occupations when employed: Company Director, Clerk, Salesman, 2 never employable.
Occupations after operation: Retired, Clerk, retired, sheltered work in family business, Housewife.

Patient unemployable for 3 years before operation: 1.
Occupation: Clerk. Post-operative: Housewife.

Patients only sporadically employable over the 2 years before operation: 5.
Occupations when employed: Nurse or Gardener-Companion, Boxer or Referee, Moulder, Help in riding school, School-teacher.
Regular occupation after operation: Nurse or Companion, Butcher, Moulder, Saleswoman, Nursing Orderly.

Patients regularly employed up to within a few months of operation, though with difficulty and time off: 5.
Occupations: Secretary, Clerk, Factory Worker, Physiotherapist, Comptometer Worker.
Occupations after operation: Secretary, Clerk, Factory Worker, works very sporadically, Comptometer Worker.

Housewives: 7, all paralysed into inefficiency.
After operation: 6 were efficient, 1 always inefficient was slightly more so.

As regards life within the family, it may be said that 15 of the patients were not merely welcome in the home, but were held affectionately as additions to the home circle who could ill be dispensed with. The 8 other survivors could not be so enthusiastically described, but 4 of them were tolerated far more easily than before and evoked a positive affection from their relatives which satisfactorily outweighed any co-existent feelings of carrying a cross. Four of them did not evoke affectionate responses beyond those that were felt as a matter of duty; they were tolerated in much the same fashion as before. Finally, in 2 cases there was some degree of permanent recurrence—of compulsive thinking in 1 instance, of rituals in another. There

was a slight transient recurrence of rituals in a setting of special difficulty in a third case.

Atypical Cases

It remains, before summarizing our results, to consider briefly 5 other cases whose obsessiveness was basically responsible for the development of those syndromes that brought the patients to operation. Yet the illnesses were so coloured by other features as not to have presented as obsessional states of an ordinary sort.

A man of 35, with a cyclothymic family history, and a schizoid personality (in the sense of being intellectual, introverted, aloof, lacking in affective warmth and drive, with a tendency to preoccupation with highly theoretical matters), had had a number of *clear-cut manic and depressive attacks from the age of 22 onwards.* These were further complicated by the development, from the age of 27, of obsessive-compulsive preoccupation with the testes, which he felt obliged repeatedly to handle although he believed that by so doing he would irreparably harm himself. Repeated attacks of depression, coupled with a state of conflict over his obsessions, had obliged him to abandon his regular occupation some 6 years before he came to operation. When seen preoperatively he was exceedingly tense and excited, hopelessly indecisive, and preoccupied with what he called the 'elastic tissue of the testicles which has led to torsion,' which, coupled with his agitation, had caused what he repeatedly referred to as 'this double trouble.' His thinking was scattered and bore no relation to the realities of the situation. His mode of expression was peculiar in that he spoke largely in metaphor. His conversation was in general very difficult to understand, and, when its meaning was elicited, was directed to no profitable end. He was considered to show schizophrenic features in addition to his other disabilities, and such an element was probably responsible for the extreme apathy and lethargy, with occasional apparent blocking of thought, which characterized his post-operative state. As regards his preoperative preoccupations he was much improved, but he was still inclined to obsessive worry over his business affairs and his future, neither of which he tackled, while he remained mildly and continually depressed for about a year, after which, despite an increase in cheerfulness, alertness, and interest, with a decrease in worry, he has continued a lethargic and apathetic man without plans or initiative. He sought only quiet pleasure and the avoidance

of difficulty or effort. He had gained in that he was far less distressed and was free from the necessity of being admitted to hospital, so that he could live quietly on his private means, but he had lost all but the simplest of life's savours as well, apparently, as any potentiality for returning to his previous normal. It must, however, be admitted that he had been incapacitated from work at his proper level for many years before operation, and that the slow but definite improvement made during his second post-operative year precludes any dogmatic statement as to his future.

CASE 111, with a recurrently depressed father and a deteriorated schizophrenic brother, had a long history of mood swings of manic-depressive type before being invalided from the army on that account at 25. In the ensuing 10 years he was admitted on 5 occasions to mental hospitals, where, in addition to changes of mood, he showed an increasing hypochondriacal obsessiveness, with impulsive behaviour, scattered and ill-directed thinking, and bizarre notions (in which there was disorder of consecutive thought) of overcoming his imaginary physical ailments by concentration of his mind on strange symbolic designs. Post-operatively he lost all hypochondriacal preoccupations, to the extent of pooh-poohing the idea that they had seriously troubled him; his mood remained equable; he was a practical and straightforward thinker. His hesitant and deferential attitude to life had given place to a confident *bonhomie* and a contempt of difficulty. Whereas he had been pre-operatively excessively respectful and diffident, when post-operatively visited he slapped me on the back, saying, 'And mind you come again.' He became a miner (during which he was convicted of theft from a co-dweller in his miners' hostel, though the circumstances were such that a post-operative carelessness rather than intention may well have been responsible) until discharged on account of a suspicious X-ray, after which he became a street cleaner, which occupation did not compare unfavourably with such previous forms of employment as he had periodically obtained.

CASE 113, an intelligent woman of 29, married and with 1 child, had multiple morbid fears with extreme tension and swings of mood that did not occur in harmony with the mental content. She was morbidly self-conscious with feelings of inferiority and excessive meticulousness. Her fears were of a bizarre kind; she was afraid of electricity, which—like Mr. James Thurber's aunt—she believed to leak from the plugs, and which she feared might cause her child invisible harm. Likewise she avoided any place where she might come into even remote contact with radar; she was afraid

of herself receiving and transmitting the emanations from such apparatuses with injurious effect. Having read an article in a paper by a man who had visited Bikini, she felt that the author might have transmitted some radio-active influence, accidentally acquired there, to the particular copy of the *News of the World* in which she had read it; further, she felt that the coalman might have read the article also, and that, if he had, he would in his turn have transmitted something of these emanations into the fabric of his coal lorry, wherein they would have been imprisoned by the fact of his having subsequently had it painted, and that they would thence have irradiated the coal which he delivered. For protection from the possible dangers of this she indulged in rituals. She had excellent rapport; she had insight into herself; she gave a clear and detailed history; she was free from delusions and hallucinations; her sensorial faculties were unimpaired; her judgment was within normal limits to formal tests; her husband had found nothing in her to suggest insanity. Yet the very nature of her fears, coupled with a failure to repudiate with full conviction the suggestion that there might be truth in them, was an indication of something beyond the ordinary range of obsessive-compulsive neurosis. Post-operatively she had lost her self-consciousness and her inferiority feelings, her mood was equable but she was emotionally flat, her fears occurred to her but without compelling force so that she used the electricity with very little hesitation, she performed but few rituals and those occasionally. Shorn of her preoccupations, she was more efficient than she had been for some years, but, though now more active, she was more fatigable. She dealt better with her child, and, though she expressed herself more readily, her irritability was less. She was also more able to enjoy herself. By the end of a year her energy was greater, her intellectual activities were less restricted in that she had learned new pieces for the pianoforte and had read much (having abandoned her habit of having only the clean books from the public library since she found that those, of course, were the ones which nobody wished to read), and she had become determined to start a business of her own as a protection against what she conceived of as her husband's spendthrift ways. These last she seemed certainly to exaggerate, and that was one of the queer things about her; the others were a fundamental apathy which led her to say, 'I'm not sure that I'm fond of anyone,' and a kind of hesitancy which seemed to arise less from obsessive doubt than from suspicion. Thus, there was a discrepancy between her outer and her inner life which made one feel far from assured of her recovery.

The other 2 cases were different in that they presented as affective disorders. In one of them many years of obsessional preoccupation with health, centring especially around fears of cancer, had brought about a state of chronic wretchedness with innumerable medical investigations, repeated admissions to hospital, and finally severe depression with suicidal ruminations in a woman of 45. There were no rituals. The 'cure' was dramatic. The patient felt, and was declared by her relatives to be, better than for 14 years. There were personality changes of an insignificant kind, but the hypochondriacal ruminations and fears had entirely disappeared, after more than a decade of unremitting querulousness. The doctor's eyes almost started from his head on hearing the husband, who post-operatively brought the patient back to hospital with sciatica, entreat: 'I do hope you'll insist on examining her, doctor. You know what she is, she'll never complain.' The other obsessional case who had presented as one of affective disorder had had a previous depression with suicidal attempt following highly disagreeable experiences from which she had been unable to detach herself. The cycle of events was repeated after very severe physical and psychic traumata when she was interned in a Japanese prison camp. Despite many visits to hospital and elaborate treatment, the patient became increasingly and obsessionally preoccupied with suicide. Again, there were no rituals. Again, the 'cure' was dramatic. She is now, more than 2 years after operation, happily remarried and a successful stepmother and mother with personality changes that are negligible.

Thus, of 5 cases all basically obsessional, but who did not present as characteristically such, there were 2, who had presented as cases of affective disorder, who made dramatic recoveries which have been sustained. There were 3 others with schizophrenic admixture (2 of whom had manic-depressive admixture as well) of whom the least schizophrenic made an excellent recovery, another had superficially made an excellent recovery but led an unharmonious inner life, while the recovery of the third had been very limited. Only 1 of these 5 cases had had marked rituals, and those were not deeply entrenched; they disappeared almost entirely after operation.

Summary

(1) In 24 straightforwardly obsessional cases there were 15 women and 9 men.

(2) Their ages varied between 17 and 50, and the duration of symptoms between 3 and 40 years.

(3) All cases except 1 had had extensive treatment of one sort and another without effect.

(4) All patients were totally incapacitated from working at the time of operation, and only 2 of them were able to lead lives which had any outward semblance of normality.

(5) Nineteen out of the 24 patients had been incapacitated from regular employment for more than 2 years before operation: 6 had been unemployable for a minimum of 8 years, 1 had been unemployable for 3 years, 5 had been only sporadically employable for 2 years, and 7 housewives had been mere passengers in the home.

(6) One patient died as a result of operation.

(7) One case shewed post-operative epilepsy, with one fit 23 months and another 35 months after operation.

(8) None of the survivors was worse.

(9) Of the survivors, there were 15 patients who showed ritualistic behaviour before operation. Seven were obsessive-compulsive ruminants who had no rituals, while an eighth had virtually none.

(10) Obsessive-compulsive rumination yielded to operative treatment more readily than did ritualistic behaviour.

(11) Of the obsessive-compulsive ruminant patients, 6 out of 8 lost their symptoms entirely, and the other 2 were much improved.

(12) Of the 15 ritualistic patients, 6 lost their symptoms entirely, 8 showed varying degrees of improvement, and 1 was virtually unchanged. The residual symptoms were mainly of ritualistic type.

(13) The factor which appeared to be of importance in determining whether the rituals were or were not continued after operation was the extent to which they were entrenched in the behaviour of the patient. The same rituals carried out automatically without variation in form and

independently of circumstances carried a poorer prognosis. The more the rituals were varied—in form, in frequency, in irregularity of performance, and in relation to circumstances—the better the prognosis for treatment by operation.

(14) There was no indication that the underlying psychopathology affected the post-operative outcome.

(15) There was no indication that the attitude of the patient towards the condition affected the outcome, except in so far as such attitudes may pre-operatively have conduced to the greater entrenchment and automaticity of the ritualistic behaviour.

(16) The duration of symptoms did not seem to be of consequence except in so far as it gave greater opportunity for the development of entrenched and automatic rituals, performed independently of outside circumstances.

(17) Age or sex of the patient did not appear to influence the outcome.

(18) In general, the same thoughts occurred to the patients after operation as had occurred to them before; but they recurred with diminished frequency and force. In those cases who are described as having lost their symptoms, the diminution in frequency and force was such that any residua of that kind were no longer regarded by the patients or relatives as symptoms, in that they did not handicap the patient in any way.

(19) All the survivors were discharged from hospital, and have continued to live without need of medical attention for a minimum of 2 years.

(20) There was some degree of recurrence in 3 cases: an obsessive-compulsive ruminant developed a habit of compulsive counting after a year: a girl of 17, very severely affected by phobias and with elaborate rituals, whose attitude towards the condition was one of off-hand evasiveness so that grasp of the psychopathology was never satisfactorily obtained, had a slight exacerbation of her residual symptoms in the second post-operative year, but was still able to work, which she had been unable to do before operation: a patient with a great variety of phobias and rituals, none of which

was entrenched, had a transient recurrence in a setting of special difficulty in the second post-operative year.

(21) There were post-operative personality changes of disadvantageous sort in 11 of the 23 cases. In 3 out of those 11 the gains secured by operation outweighed the disadvantages; in 8 out of the 11 cases the gains secured by operation were such as to reduce the disadvantages to insignificance.

(22) The main personality changes took the form of indolence, irritability, and a complacent selfishness; they were present in varying degrees, but, as has been said, were never such as to equal or outweigh the advantages gained by operation.

(23) There were abnormalities in the personalities of the other 12 survivors, but these consisted of modifications or exaggerations of peculiarities previously present, and assumed no importance in the total picture.

(24) There were intellectual changes of an elusive kind, not demonstrable by simple tests, but which could be inferred from the patients' behaviour in the life situation. They consisted of a shift in values of a more rather than less subtle kind, and of a difficulty in grasping complicated issues.

(25) Such intellectual changes were not of consequence in the function of these particular patients, though they might have been in people whose work involved a higher intellectual range.

(26) As regards restoration of efficiency, of 5 patients unemployable for 8 years or more before operation, 1 undertook clerical work of much the same order as before, 1 became an efficient housewife and has had post-operative literary work published, 1 works in very sheltered circumstances in a family business. Another patient unemployable for 3 years before operation has become an efficient housewife. Of 5 patients only sporadically employable over a period of 2 years before operation, 1 resumed work as a trained nurse, 1 resumed work as a moulder, 1 worked as a nursing orderly instead of being a school-teacher in training, and the other 2 were employed at their pre-operative level. Of 5 patients regularly employed up to within a few months of operation, though with difficulty and time off, 4 have

resumed their former work and 1 works sporadically with no more than a pretence of application. Of 7 quite inefficient housewives, 6 became efficient.

(27) As regards social harmony, 15 patients were welcomed by their relatives with warm affection; 4 were tolerated far more easily than before so that their presence evoked more affection than regret; 4 evoked responses that were dutiful rather than affectionate, and were tolerated in much the same fashion as before.

(28) Taking a total view, of the 23 surviving cases there were 11 which might be considered very good results in every way, 9 in which there were substantial gains, 2 in which the gains were moderate but distinct, and 1 who was on the whole unimproved.

(29) There were, in addition, 5 fundamentally obsessive cases who presented in somewhat different guise.

(30) Two were men of 35, who showed both schizophrenic and manic-depressive admixture. One was symptomatically improved but with poor potentiality. The other was in some ways better adjusted after operation, and earned his living after almost 10 years of previous failure.

(31) One was a woman of 29, with schizophrenic admixture. She was symptomatically much improved, and gained much in efficiency, but she cannot be considered to be entirely free from either obsessive or schizophrenic features.

(32) Two were women of middle life who, bound by obsessionalism to intolerable thoughts, reacted with severe depression. One was entirely preoccupied with hypochondriacal fears, the other with past severe psychic and physical trauma. Both became serious suicidal risks. Both made dramatic recoveries, sustained for more than 2 years.

(33) In all 29 cases of this group as a whole the debits and credits of the previous personality contributed correspondingly to the final post-operative result. This was especially apparent in the case who was virtually unimproved (CASE 106, pages 360–363), who, pre-operatively egocentric and lacking in drive, became more so after operation.

THERE were, of course, many psychopathic personalities among the patients in this series. Indeed, we have noted that a predominance of psychopathic traits in the patient's pre-morbid personality is an unhelpful factor in the post-operative outcome. In most instances it was on account of some concurrent symptoms—schizophrenic, depressive, or obsessional—that operation was undertaken. But there were 8 cases in which it might be said that the operation was undertaken for treatment of the actual personality itself, and it is this group which we have now come to consider. The term 'psychopathic personality' is an elastic one which lacks precise connotations, but a brief account of the cases will suffice to show the material without the necessity for entering into discussion of sub-categories.

Of these 8 cases, 1 died within 6 weeks of operation, having fallen gradually into a coma for which no satisfactory cause was found. Permission for autopsy was refused. No doubt was felt, however, that the coma arose from some intracranial cause, and the death has accordingly been classed as due to operation. This left only 7 cases in this group for study.

Three of these may perhaps best be described as 'inadequate psychopaths.'

CASE *290*, a woman of 53, claimed to have had a wretched life. When she was 6 her inadequate and neurotic father failed in business, made a suicidal attempt after which he was admitted to a mental hospital, and, as her mother had died the year before, the home was sold up and she was looked after by an aunt and paternal uncle. This couple beat and exploited her. The uncle would expose himself to her and made erotic advances; he later hanged himself. She was afraid of these guardians and became a household drudge to placate them. At school she was equally afraid, with inferiority feelings and a paralysing timidity. Her personality was not improved by a change of home to another aunt, equally unsatisfactory, who is said also to have kicked and whipped her. Escape to the care of an older sister might have been helpful had not the patient developed successively pneumonia and rheumatic fever. By this time she was thoroughly demoralized, with deeply entrenched feelings that she

was unwanted, a victim of fate, and an inferior person. Puberty was accompanied by a guilty disgust over sexual matters, probably related to her earlier experiences with her uncle. She entered domestic service, where she said that she was exploited because she was willing but had not learned to take her own part. She showed some initiative in self-education, and finally secured a job as a cashier in which she met and married her husband at 23. She complained that her husband tried to thwart her over having children. 'He didn't want them and they were all I longed for.' In fact, she had 5 children in less than 9 years, of whom she lost 3, and the survivors were a constant anxiety to her. She was an over-protective, over-demonstrative mother, nagging and nattering, setting unduly high standards for herself and everyone else, with waxing and waning enthusiasms, and with self-pitying moods when life did not come up to her demands which became increasingly snobbish as time went on. Her husband, an unsympathetic man who had much to make him so, tried to find pleasures outside the home, and the patient then felt lonely and neglected, so that she had an affair with a lodger over which she felt much guilt and remorse. The husband had a financial reverse so that a move to a poorer house was necessary. This brought out the worst in the patient in that, though she kept house scrupulously, she was ashamed of it, avoided her friends, tried not to let them see her going home, would never admit anyone 'because the passage was so dingy,' etc. During the war she became over-concerned about her son on active service, and the generally more difficult conditions of life impaired further her already precarious stability. Her irritability, nagging, and self-pity became so gross that she went, with little benefit, to a mental hospital as a voluntary patient. Later, she was much troubled when her elder son emancipated himself so far as to get married. When she came to operation her husband said: 'You can more or less see for yourself, she's a burden to herself and everyone else, everything's all wrong no matter what you do. Oh, yes, she nags, and she can't sleep without taking drugs, and next morning the drug hangs about her and she's miserable. She's losing all her companions one by one, she's so irritable and complains of herself the whole time. This older boy's marriage has really upset her, he's the first-born and she thought he shouldn't have gone, and she hates the person who's taken him. . . .'

The essentially variable nature of her state was indicated by: 'Some days she's really bright, other days she's moaning. She's continually nagging at home, but when any stranger comes in she

pulls herself together, specially with her niece, then she's quite jovial and normal, you wouldn't think there was anything wrong.' At interview also this variability was evident, as the patient volubly and histrionically described herself. 'Of course,' she said, 'I'm awfully sorry for myself, I realize that, but I can't correct it.' No doubt self-pity had coloured her account of her early life. Withal this, she was a good woman; her feelings were impulsively warm; she was never intentionally unkind; she strove against what she recognized to be her faults; she denied herself much; she tried to give of her best; she had a certain cultivation of mind which was the product of idealism and effort. But her ideals were constantly beyond her surroundings, and she was never able to withstand her disappointments without intensity of emotion which caused her to crave for a sympathy which she could not get, and in the absence of which consolation her sense of insecurity was overwhelming. In this setting minor obsessional traits had developed, and in relation to minor organic illnesses the patient had shown hysterical paralyses, screaming attacks, and various hypochondriacal convictions. Yet none of her symptoms was sufficiently sustained to allow of any firmer diagnostic label than that of psychopathic personality with hysterical tendencies and of inadequate type.

After operation the patient developed a large appetite with loss of her many former food fads; this returned to normal within a year. She gained 20 lb. in weight in 6 months and 42 lb. in a year. She still had her lifelong difficulty in getting off to sleep, but it no longer troubled her and she no longer took sedatives. Her bowels acted with regularity, and she no longer troubled about a lifelong complaint of constipation. She had some urgency of micturition not previously present, and might dribble in the street some 2-3 times a week, but after a year there was no incontinence, though the urgency persisted.

At the psychic level she was less worried and emotional, though by no means devoid of affect. She would feel a lump in the throat on hearing favourite sentimental songs, and even when excited and gratified by the unexpected return of Mr. Truman in the American presidential elections. She still disliked intensely hearing of any cruelty, and she felt sentimentally sympathetic on seeing children return to school after the holidays. But events distressed her less, so that she no longer cried 'She's more hard-hearted now,' said her husband. 'She'd do any amount of good to people, pay their rents and never get the money back, that sort of thing: only the other day she did that, but she's not so soft as she has been, in this particular

instance she was sure the person really needed it. She's just as fond of us as she was.' In fact, her morbid sensitiveness was reduced, leading to much more stability. 'I'm not as emotional as I used to be, and I'm not nearly so bad-tempered.' 'She hasn't got that temper, [illegible] or less, she's got on to the boy [illegible] She's more cheerful now, all that [illegible] she doesn't ask for sympathy.' 'I've lost all desire for treatments, and I never discuss my illness with anyone.' She was thus much more confident, and though she felt whenever anyone specially looked at her that this might be because she had been in the local mental hospital, she wasn't disturbed by the thought. 'I haven't any of those inferior feelings now that I used to have.' Correspondingly her relations with others improved, *and she was more realistic. 'I think the children's growing up upset* me, I think it was my over-anxiety to be good to them, I still miss them, but of course it's silly and I try to look at it from a logical point of view. My son's wife doesn't worry me in the least now. He's got a wonderful wife. I've lost all that jealousy, I don't know why I had it. . . .' 'This house is still a bugbear to me. I can't face the fact that we'll never get out of it. Still, we can't afford to pay the rich man's price. . . .' But she was much less ashamed of it. Corresponding with this diminished affect her urge to perfection was reduced. Pre-operatively she had said, 'I wanted a nice home for my children, wanted to educate them, wanted them to have music, and I couldn't, and I feel they reproach me. Every Christmas I used to get frightfully depressed although I'd done all that I could. I felt it wasn't good enough, and I used to get impatient and get into tempers though I just adored them. . . .' She was post-operatively more easily satisfied. 'She's not so over-particular about the house now as she was at one time.' She no longer got up at night in a flurry because she couldn't sleep and started to clean the windows. 'I've lost that urge to work.' 'I used to have to keep it clean as a compensation, to try to make it look a little better. Now I'm not so particular though I'm still clean.' (The house, indeed, was scrupulously kept.) And correspondingly her activity was reduced while she said also that she had less energy and was more readily fatigued—a state of affairs that continued at the end of a year. Yet she was energetic enough to do nothing in slipshod fashion, and she would even wash again for herself items returned from the laundry which had not been done to her satisfaction.

This thin, harassed, furrowed, and querulous little woman had become a tranquil Amazon of 12 stone. 'I'm certainly better, every-

one says how much better I look, they say I look younger....' And her doctor, from whom she had kept away for 12 months, after treating her almost daily and to the point of exhaustion for 24 years, was unable to recognize her on meeting in the street.

CASE 291, a spinster of 51, the daughter of a temperamental actress and an unknown father, was brought up by a foster-mother of whom she seems to have been shallowly fond, more for the sake of the money and security provided than for other cause. She was untroubled by being backward, though not stupid, at school; she was untroubled by lack of social contacts; she neither had friends nor wanted them. She greatly enjoyed, however, importing poor waifs and strays to tea. 'I did it,' she said, 'because I felt so sorry for them, they used to look so pitiful.' But she was sorry for them only for an hour, after which she cast them out both from the house and from her mind, nor ever asked the same ones to return. She did a great many different jobs, from minding babies to learning book-binding. 'I've always been a one that if I suddenly decide not to do a *thing, I'll suddenly give it up. I get spasms, try this and that, I'm* all for variety.' In domestic service she was a giggly nuisance who encouraged her associates to too much noise, and when she was sacked she was ill-temperedly pert. She became engaged to a man because he was fond of her, but threw him over in favour of a patient in a military hospital where she did domestic work, who had lost an arm in 1918. She seems to have seen herself in a romantic role as the self-sacrificing protector of a cripple hopelessly handicapped without her. This man soon broke off the engagement on the plea that with his disability he could not be an adequate husband, and shortly after married somebody else. He has remained, however, enshrined in the patient's memory as the man who might have been. By the age of 35 the patient became less erratic, though still moody and bad-tempered, and settled down for 12 years to be a barmaid. During this time she had some intimate affairs with male friends but without any firm attachment; at the end of it she was thrown *into sharp conflict between the desirable course of pursuing* this life and the dutiful one of returning to look after her foster-mother, now an old, chronic invalid. After long deliberations she chose the latter course, and there appeared then and afterwards many symptoms for which no organic cause could be found. These took the form of 'collapses,' with black veils over the eyes, biliousness with occasional vomiting, fits of depression, etc. The foster-mother soon afterwards died and the patient was then left on her own. She could not get her former job back, and was discouraged by her

symptoms from seeking another. Her life became empty and purposeless, she became increasingly moody and haunted her doctor for sympathy and attention. Her symptoms multiplied to include 'blank spells of the mind,' fears of traffic, while if she were near an electric fire or a powerful electric bulb, it 'seemed to go to her brain, making it go sort of numbified,' with the effect that she felt an impending collapse whenever she was near bright lights. Finally, there developed an incapacitating 'giddiness,' about which there was neither vertigo nor disturbance of consciousness, but which only amounted to a fear of falling; this was so persistent as entirely to restrict her activity and to make her constantly complain. Attempts at persuasion, explanation, and reassurance were quite ineffectual in reducing the symptoms or altering the patient's solitary and aimless mode of life, and operation was decided on after the symptoms had persisted for 4 years. At interview she was kittenish and immature, told her story with an immense wealth of histrionic detail, and made great demands on the sympathy and interest of the examiner. She was over-reactive ('The least thing and my heart is in my throat, and I can't settle down again, even if it's only a pleasant surprise'), and she admitted to a high degree of irritability and to ready dejection if she could not get her own way. She was considered to be an inadequate hysterical psychopathic personality.

After operation she was a vegetable. The same lack of drive that had characterized her pre-operative personality was post-operatively apparent in exaggerated form. Although she showed the unusual feature that she would get up in the morning more readily than before, although she did her own shopping, went for walks, read books, had no hint of 'giddiness' or of other untoward symptoms, could concentrate better, was uniformly cheerful without crying spells or self-pity (she was so lacking in insight as to say, 'I keep cheerful, I've done so all along, I'm not one of those to sit and grieve . . .'), yet she was apathetic and dull. This in itself indicated a diminished affect which, as in the previous case, promoted more harmonious social relationships so that she had stayed with relatives with neither sulks nor ill temper though she had been on persistently bad terms with them before, owing to excitability poorly controlled. A year after operation she was still neither working nor looking for work; she gave as her excuse that she felt (in all probability correctly) that her energy was reduced, and she believed that she 'would get too tired.' She was living on her capital which had been augmented (thus staving off further the need for work) by a legacy. 'If it weren't for that,' she said, 'I don't know what I'd do,'

and certainly she showed no inclination to do anything. There was some return of affect in that she was less flat, was more dramatic in her recital, talked with greater animation and with mimicry. Also, there was some return of symptoms. There was no 'giddiness,' nor were there black veils or 'numbified' feelings, nor fears of traffic; but there were 'spasms.' These were depressive moods, lasting a day or so, apparently promoted by boredom, but which she did nothing to alleviate. She no longer regarded herself as quite well, which she had done at 6 months after operation. Now she said, 'I think I'll get better one day, and it'll all turn out right in the end. That's the way I look at it.' This complacency was unwarranted by any logical expectation. Two years after operation she had still done nothing about a job at all, still felt lazy and disinclined for work, still was living on her capital which was now reduced. She now gave as her reason for not working that if she stood for long she 'felt sort of giddy,' though when asked about giddiness at another time she said that she felt none. The spells of depression had now ceased, but had given place to 'nasty fainting turns, don't actually go off, but just as if you're going to faint, a few times I've nearly gone but I've managed to come round, it just passes off, you know. . . .' She led the same sterile life, though now it was relieved by visits to the films (of which she had been 'terrified' before as she had once had a 'black-out' there, so that she had not been for 4 years before operation), by visits to London and the seaside, and by making toys for and looking after her landlady's child. But she knew few people, took no interest in current events, would not knit or sew though she would crochet occasionally, and her activity was minimal.

The personalities in these two cases were quite different, even though the diagnostic label may be the same. Both showed conversion symptoms, both were unduly fearful, both were *immature and dependent, both showed inappropriate excesses of* emotion, and both craved sympathy and attention which neither got. But the former had a drive towards perfection which the latter lacked; the former had been able to subordinate her welfare to that of others, the latter had been almost purely selfish; the former had been handicapped by a real excess of emotion, the latter was nothing but shallow; the former was warmly and overly affectionate, the latter had no attachments; the former was aiming at stars beyond her reach, the latter was aimless; the former was disappointed at not reaching what she strove for, the

latter was unrewarded because she had striven for nothing. In the former a mere reduction of affect, and *pari passu* of drive, sufficed to produce a tolerable personality who could tolerate herself. In the latter a reduction of affect, and *pari passu* of drive, made an aimless person more aimless, and—while it took the edge off discontent and therefore off the symptoms—it left her with no assets on which to build. So, as the affect began to return, the disagreeable symptoms began to return also, for there were no satisfactions by which discontentment could be assuaged.

The third inadequate psychopath showed a personality and a post-operative result somewhat between the two.

A harassed and immature man of 32 said, 'I've been very badly neurotic all my life. I can cope after a style. I can do what I'm told reasonably well, but I don't seem to have any initiative or to make full use of my abilities. I'm afraid of people all the time, I close up, I can't really express myself, I've no personality at all. I've difficulty in making decisions. There seem to be two forces acting all the time: one that makes me want to do things, the natural urge, as it were, and the other that holds me back from deep inside, and then I can't make up my mind what to do. Instead of looking at it in a sane and balanced light, I've got a sense I must do everything in a rush, must rush through things, can never take things steady. It's usually that I've half a dozen things to do at the same time and I can never really settle down and do anything.' He said that he was very much attached to his mother, and as a small child had been jealous of his younger brother though he himself was the favourite. His father had died when the patient was 9, and the mother had married again 18 months later. The stepfather was a man of quite different calibre: rude, uncouth, given to shouting, and a bully who despised both education and intelligence. The patient became a fulcrum about which family squabbles rose and fell, specially as regards his behaviour and his future education. Always timid and easily rendered unhappy, he became more so. 'There was something odd and strange about me that other boys would pick on, and I could never stand up for myself, so I always became a target for the bullying type.' He never mixed and had only one close friend. He had two recognized interests, music and the construction of wireless sets, while he developed a secret one in the form of writing. At 17 he left school with pleasure, and entered a firm in which he was employed on radio construction and design. He liked the work and was very skilled, but otherwise he gained few satisfactions. 'I played cricket

one year, but never had the confidence to do well, I was too high-strung and nervous, I always felt unnatural and out of it, I can never think of the right things to say at the right time....' Physically, however, he was well, and he was never off work either through organic or neurotic illness. At 24 he married the only girl he had ever known, after an 18 months' acquaintance. His sense of insecurity was increased, as was his indecisiveness and his inability to get started on things. 'Had I when I got married had the knowledge I've got now, I wouldn't have got married. At that time I thought in my ignorance that marriage was just the thing to give me new interests and pull me out of myself.' He attributed the worsening of his symptoms to the responsibility and reduction of freedom entailed by marriage. In the following year he joined the R.A.F., in which he served for 5 years of war without breakdown and gained the rank of corporal. He tolerated the life quite well, mainly because the work was interesting and it enabled him to escape from home, but he was unsettled, uneasy, and friendless. On demobilization he became moody and apathetic, sometimes for an hour, but sometimes for 2 or 3 weeks at a time: 'Everything is too much trouble and I just sort of mooch around and can't make up my mind what to do.' These moods were without effect on appetite, weight, or sleep. His wife confirmed this general picture, and it was apparent that the domestic situation had added rather than otherwise to the patient's cares. He took no joy in his children but was oppressed by the responsibility they entailed; he had twice resorted to ingenious tricks (one of them dangerous) in the hope of startling his wife into an abortion. He spent all the time possible (including his war-time leave) at his mother's home, whence he returned to repeat maternal criticisms to his wife. The latter was a robust, rather jolly woman, of whom it should have been easy to be fond, but she lacked a certain undue refinement instilled into the patient's upbringing; her sense of values was quite different, and the home under her management was far from homely; she replied firmly to her mother-in-law's criticisms so that between them the patient was a source of contention, as he had been between his mother and stepfather when he was young. 'He's been spoiled by his mother,' said the wife, 'it was ridiculous. His mother has always taken every responsibility and every worry off his shoulders. If everything goes wrong he goes back to his mother's. I thought I was going to have another baby and told him; he got straight up from the table and got his new suit out and went round to his mother's; he used to do it almost every week She wouldn't let him chop wood after we

were married. She even bathed him after he'd left school. It's a shame, it's stopped him from developing. He's not a man.' The wife considered the patient's moods directly related to his 'back-to-mother' trends. In this atmosphere the patient was morose, sometimes not speaking for days on end, sometimes writing farewell letters with suicidal threats. When he did talk he talked only of himself, '...and makes the lot of us miserable talking of how miserable he is.' Even then he could be jollied out of his mood and made to laugh, but the change was brief. In this state the patient sought psycho-analytic treatment; as this was found impracticable for various reasons, he was treated at a rehabilitation centre without improvement, and then had 20 psycho-therapeutic sessions. A sudden improvement which occurred in course of these was not maintained, and after some 6 months, operation was decided upon. 'I think,' wrote his psycho-therapist, 'there is no doubt that this man is suffering great tension and continual unhappiness, and in view of the failure of psycho-therapy to help him, I have reluctantly come to the conclusion that leucotomy is justifiable.' Indeed, the patient had come to develop 'sensations of panic as though I've got to rush away somewhere, and I've got to keep a thorough grip on myself to keep myself under control.'

The operation made no dramatic change, either at physiological or psychic levels. Certainly the panic attacks were stopped, the patient was more at ease and less tense, and he experienced less difficulty than before in dealing with his superiors of whom he felt slightly less alarmed. But it was an improvement that could be noted only by careful comparison. Further, the patient was demoralized by the absence of a fundamental change in himself for which he had hoped, despite having undergone what he regarded as the last resort in treatment. His wife noticed a few small changes in him; he did not talk about himself and his misery, he was more extraverted in that he took notice of outside things, seeing for the first time a wall that had, in fact, been put up 2 years before, noting things about the house, giving her a bunch of flowers for the first time, etc. He was slightly more aggressive, had even struck his wife once, and once had struck one of the children for saying 'ain't' instead of 'aren't.' (Pre-operatively he had said that he did not get irritable: 'I've got no temper, no spirit, that's one of my weaknesses.') On the other hand, he was less active, less spontaneous, less careful of his appearance, and—when chided—refused to change his underclothes, and for 2 weeks went to bed without undressing and refused to shave in the morning. These last were gestures of self-

one year, but never had the confidence to do well, I was too high-strung and nervous, I always felt unnatural and out of it, I can never think of the right things to say at the right time. . . .' Physically, however, he was well, and he was never off work either through organic or neurotic illness. At 24 he married the only girl he had ever known, after an 18 months' acquaintance. His sense of insecurity was increased, as was his indecisiveness and his inability to get started on things. 'Had I when I got married had the knowledge I've got now, I wouldn't have got married. At that time I thought in my ignorance that marriage was just the thing to give me new interests and pull me out of myself.' He attributed the worsening of his symptoms to the responsibility and reduction of freedom entailed by marriage. In the following year he joined the R.A.F., in which he served for 5 years of war without breakdown and gained the rank of corporal. He tolerated the life quite well, mainly because the work was interesting and it enabled him to escape from home, but he was unsettled, uneasy, and friendless. On demobilization he became moody and apathetic, sometimes for an hour, but sometimes for 2 or 3 weeks at a time: 'Everything is too much trouble and I just sort of mooch around and can't make up my mind what to do.' These moods were without effect on appetite, weight, or sleep. His wife confirmed this general picture, and it was apparent that the domestic situation had added rather than otherwise to the patient's cares. He took no joy in his children but was oppressed by the responsibility they entailed; he had twice resorted to ingenious tricks (one of them dangerous) in the hope of startling his wife into an abortion. He spent all the time possible (including his war-time leave) at his mother's home, whence he returned to repeat maternal criticisms to his wife. The latter was a robust, rather jolly woman, of whom it should have been easy to be fond, but she lacked a certain undue refinement instilled into the patient's upbringing; her sense of values was quite different, and the home under her management was far from homely; she replied firmly to her mother-in-law's criticisms so that between them the patient was a source of contention, as he had been between his mother and stepfather when he was young. 'He's been spoiled by his mother,' said the wife, 'it was ridiculous. His mother has always taken every responsibility and every worry off his shoulders. If everything goes wrong he goes back to his mother's. I thought I was going to have another baby and told him; he got straight up from the table and got his new suit out and went round to his mother's; he used to do it almost every week She wouldn't let him chop wood after we

best, while he was more inhibited and with less capacity for friendship. He resembled the second of our inadequate psychopaths in being an isolated person with little drive, but he differed from her in having definite interests, in living less excitedly for the moment, and in having firmer patterns of behaviour (though less self-confidence) which he always tried to maintain. He differed from both in lacking their tendency to dissociation, and was thus free from gross hysterical phenomena. The post-operative result, like the pre-operative personality, comes midway between them.

Now, in contrast to the foregoing, there were 2 aggressive psychopaths.

Case 293, a girl of 16, found herself strangely placed as the illegitimate daughter of a deaf and dumb mother who, when the patient was aged 8, married a deaf and dumb baker. The patient had lived with her mother in various institutions in which the latter was employed in domestic duties. She sustained three minor head injuries through falling, one at 3 months and the other two at 18 months. She walked at 13 months but did not talk till she was 3 years old. Though not otherwise backward, she was nervous in the sense of being easily frightened, and was difficult and aggressive; her temper varied very much according to whom she was with. Between the ages of 3 and 9 she was said to be happy, rather too quiet and reserved, but subject to occasional screaming fits. That she was not considered essentially within normal limits is shown, however, by the fact of her referral for psychiatric advice. She was considered to be a 'pleasant personality,' and was found to be well above average intelligence. It was considered then that 'her difficulties were due to her early environment.' After attending as an out-patient for play and group therapy, she was sent to a home as part of an evacuation plan, but the deaf and dumb mother having in the meantime married her deaf and dumb husband, the patient was restored to her mother against advice. This was hardly an ideal environment, and it was rendered less tolerable by the fact that the mother had 'a very nasty temper,' and, according to the matron of one institution in which she had worked, had 'been seen actually to jump her own height in a temper.' In this setting the patient became very badly behaved, with aggressive rages and quarrels. These were not helped by the mother stressing to the child the fact of her illegitimacy and unwantedness, which intelligence was communicated to her by others through whom the mother could make herself

assertion, as was a certain irresponsibility over money in that he wouldn't be bothered to pay the rates and was nonchalant when pressed to do so. He continued thus, slightly less tense than pre-operatively, but hardly less unhappy (for he had written further suicidal notes), a shade less restrained, so that when provoked he was more assertive, but otherwise less active and spontaneous, until—13 months after operation and after some talk of separation—he laconically told his wife he had changed his job to one in which, for the future, he would have to live away from home. Having done this he felt much improved. He made his wife an allowance and visited the children occasionally. He enjoyed his work, was happier and more at ease. He struck up an intimate friendship with another woman and in general was more sociable. His whole poise was better and his confidence was increased. His personal habits, away from his wife and from chiding, were normal, and he showed no irresponsibility. His spontaneity returned, and he was normally active. (He was punctilious enough to walk a mile and a half and to wait for half an hour in the open on a cold morning merely to ensure that I did not lose my way when going to see him.) His mother could detect no untoward characteristics in his personality at 18 months after operation. He felt in no need of psychiatric or medical advice.

In this case it is clear that the change of environment and evasion by the patient of marital responsibilities were critical factors in his improvement. But it must be remembered that mere separation from his wife during the war had in no way provided him with a satisfactory social adjustment. It might, therefore, have been the solution of his marital conflict, by separating finally, that so much helped him to improve; but to claim that would be to forget the poor pre-marital social adjustment and the long history of social inadequacy as a child and adolescent. It seems, therefore, that the operation did here contribute something, and if at first the patient lost spontaneous activity and sense of responsibility, he had regained some of both in a short time, with the advantages of increased self-confidence, absence of anxiety attacks, and a gain in peace of mind. The extent of this change was not marked, but it was noticeable. This case resembled the first of our inadequate psychopaths in being too sensitively organized, but he lacked her generosity, unselfishness, and persistence in doing her

doses of sedatives were required) was weakly positive though the Meinicke test was negative. There were less than 2 cells per c.mm.; the protein was raised to 95 mg. %; globulin was present; and the Lange curve was 2333310000. After intravenous injection of malarial blood, the patient became almost unmanageable when pyrexial. The temperature rose to 101° F. nine times, and to 103° six times, but there was only 1 rigor. Two years after admission both Wassermann and Meinicke tests were negative in the cerebro-spinal fluid: the cells were 2 per c.mm.: the protein was raised to 150 mg. %, globulin was present, and the Lange curve was 0022100000. The disorders of behaviour may have been much influenced by this condition of the nervous system, but it is difficult to think that either neurosyphilis or leucotomy contributed in any marked degree to the schizophrenic development.

A woman of 37, a pathological liar, thief, and ne'er-do-well, whose pattern of life was to be at first charming, later provocative and ill-tempered, finally quarrelsome and hostilely ungrateful, had made innumerable suicidal gestures, and had been in mental hospitals or observation wards 18 times in 8 years. She had not managed to complete her training as a nurse before being dismissed for stealing drugs, and after that time had been wayward and erratic, a trouble to all with whom she came in contact. At times she simulated disseminated sclerosis and claimed much sympathy; at other times she was a misunderstood martyr; at other times again she was a charming woman of independent means and distinguished but mysterious connections. She always ended by treating the many people who had made efforts to help her with an ungrateful and haughty nonchalance, and usually spoke ill of them behind their backs. In hospital she was a perpetual nuisance, interfering, exploiting her professional knowledge, and between whiles destructive, resentful, and hostile. Her drug addiction was incidental to an existence rich in psychopathic behaviour; it was not persistent and was not a central theme in her life; much more noteworthy were her recurrent suicidal gestures, her hysterical devices, her deceits and thefts. After operation (which, it was hoped, might mitigate her mercurial moods and reduce her suicidal tendencies by making her more extraverted and less self-pitying) she was moody to a lesser degree, less intense, excitable, and histrionic. A fluctuating but prevailing depressive affect was removed—discontentment might be a better word—and the patient was placid with a hint of the

understood. The patient bit, tore her mother's and other people's hair, and was ill-behaved at school. The stepfather was said to neglect the child, and the situation got sufficiently out of hand for the patient to be referred to a children's home at a great distance away. Here she showed bad temper whenever reprimanded, at other times would scream hysterically, would hide, and at times ran out into the streets in her nightdress. She was finally won over, however, and became 'no trouble, affectionate, clean, and good.' As a result of this improvement she was returned home, in accord with her own wishes, and a whole series of fearful rows broke out, during one of which the patient threw a teapot at a visiting social worker. She was finally admitted to a mental hospital where she was in general resistive and given to temper tantrums. After nearly a year, during which she had somewhat settled down, she was returned home at the parents' request. There was now a second child in the home, of which the patient was inordinately jealous. She worked at a factory, threw up the job and worked at a second, where there was trouble owing to her poor emotional control. As before, there were outrageous scenes at home, and after 8 months the patient was returned to hospital as a certified patient when aged 13. She would behave charmingly when it suited her; she was then a pretty, engaging, amusing little girl. At the least frustration she became a virago, noisy, destructive, spiteful, jealous, obscene, and given to smashing. Much of this was deliberately conceived, and she would give diverting accounts of how she exercised her art to evoke from the nursing staff a whole series of automatic responses, from which not only did she derive a sense of power, but afforded evidence in favour of Bergson's theory of laughter. She became, however, a patient so troublesome, so upsetting to her associates, and with so grave a future, that operation was decided upon. Six months after operation, though far from a model patient, she had become much more manageable. But within 12 months of operation she had developed a full-blown schizophrenic psychosis which has since persisted unchanged. She was dishevelled, with poor rapport, fantastically bizarre delusions, thought disorder, and hallucinations to which she answered suddenly and angrily. She had no insight at all.

Comment has elsewhere been made on the unexpected culmination to this melancholy case. It should be added that an irregularity of the right pupil had led to some investigations. Blood Wassermann was negative, but the Wassermann in the cerebro-spinal fluid (for the performance of which mammoth

than possibly contributory to the latter and to have been in no way causal as regards the former. In both the anti-social conduct was moderated and the prognosis for a satisfactory social adjustment in these otherwise hopeless cases was rather better after operation than before it. Further, they have remained more manageable while under care. From the standpoint of the nursing problem there is a slight gain.

There remain in this group 2 cases whom we may call 'schizoid psychopaths.' A certain difficulty in diagnosis is indicated by the fact that in one case the certifying doctor was reduced to saying that the patient had been under the observation of another doctor for 2 weeks and had been considered by the latter to be insane; reference to the latter showed the patient to have made a number of unexpected statements which, on diligent inquiry by myself, later proved to be true, and the only grounds for suspecting insanity lay in the patient having been garrulous, excitable, bad-tempered, and suspicious; as she was in the hands of the police at the time, awaiting a charge on she knew not what evidence, her suspiciousness may have been natural enough. When finally admitted to hospital she was diagnosed at first as being 'morally insane,' later as being 'paraphrenic,' while a curious and laconic note recorded: 'She is delusional—expresses no delusions.'

The patient was a 32-year-old countrywoman who had been brought up in very poor circumstances. She was from her earliest days unreliable, impulsive, obstinate, irritable, egocentric, and moody, while in adolescence she became also promiscuous. On leaving school she looked after the home and her invalid mother, on whose death the hostility between the patient and her father became worse, so that she escaped to do domestic work in London, where she became a tart in air-raid shelters. She formed an attachment to a man who refused to marry her (on racial and religious grounds), by whom she had an illegitimate child. She returned home for reasons of convenience and worked very hard in circumstances of great difficulty to make enough money to board the child in a residential school; but her relations with her father became worse, and she would develop furious tempers in which she was potentially murderous. To avoid this and to be nearer her work she went to live in a neighbouring town, where she deteriorated, spent all the money she had saved, took to drink, and owing to habits of promis-

fatuous. After operation she continued in wayward fashion, took a domestic post, but stole things and disorganized the household by a milder form of her previous behaviour; she lived a hand-to-mouth existence in hostels until, when she had reached the limits of scrounging and parasitism, she took a job involving clerical work at which she lasted but a few days. She had thereupon another bout of discontentment, accompanied by some insomnia, for treatment of which she made importunate demands on her doctor at all hours, before arranging her own admission to an observation ward which had always been a favourite of hers. The staff there, who knew her well, were much impressed by her facility, shallowness, and nonchalance; for the first time she had no feelings to which they could appeal; yet the very lack of these feelings was a factor in improving her stability. She got over her discontentment in a few days and went off to work, but this employment was terminated on account of an epileptic fit. She was referred to a psychiatric out-patient department where sodium amytal was prescribed; it appeared that she hoarded this after successive visits, and on one occasion she returned to the dispensary at once for more saying that she had dropped it in the street and could not find it; shortly after, she was brought into the hospital in a confused and semi-comatose state, having taken the lot; this had the appearance of a debauch rather than a suicidal attempt. Two months after that she became engaged to be married to a man who, she said, had 'polished off' his first wife and been divorced by his second. The whirlwind marriage that was planned was prevented by his being sent to jail. A month later the patient herself was remanded on a charge of larceny, but was transferred from the prison to a mental hospital. Now, 26 months after operation, she remains in a mental hospital, amenable as opposed to hostile, fatuous and shallow as opposed to intense and histrionic. She has had 3 fits in all, 2 in the tenth and 1 in the fourteenth post-operative month. The electro-encephalogram indicated a focus of abnormal activity in the right temporal area; it would seem doubtful how far the operation itself could be incriminated as a cause of this. While there are changes in this patient in that she is a less powerfully disturbing social force, and while under care is easier to manage, the case could hardly be described as having a successful outcome.

The results in these 2 aggressive psychopaths are thus difficult to assess. The ultimate outcome was unfavourably influenced by the developments respectively of a schizophrenic psychosis and of epilepsy. The operation is not believed to have been more

showed no distortions of content beyond an entire vagueness as to passage of time and as to the reasons for her detention, and told appropriate lies when asked any questions that embarrassed her. She was operated on nearly 5 years after admission. Six months after operation she was much steadier, was regularly employable inside the hospital, was no longer provocative, abusive, or angry, and though she professed to be unable to understand any reason for her detention and was thoroughly evasive over the cause of her admission, she was inclined to view everything as having happened for the best. She was discharged from hospital soon afterwards, and returned home, where she was much easier to live with. She did not quarrel with her father, she was less moody, she sang a lot, and worked with a peculiar industry, supplying her sister with breakfast in bed, doing the housework and shopping, and earning money by fruit-picking as well. She then got another post as a domestic servant in London at which she worked satisfactorily for a year, until, after injudicious libations during the clearing up after a cock-tail party, she again became pregnant and had a second illegitimate child. She continued, however, to look after herself satisfactorily, and 2½ years after operation was employed again and supporting herself. The personality changes were on the whole for the better in that she was more stable, and the only adverse feature noted by the family was a tendency to be sharp in reply, though not to any intolerable extent. The patient is classified as a schizoid psychopath because, undoubtedly psychopathic in the classical sense of the term, she did not appear to have developed any fully schizophrenic condition, but showed features suggestive of it in the form of (1) a tendency to incoherence in conversation when excited, (2) a habit of laughing for no apparent cause, (3) a curious vagueness which was something beyond evasiveness at times, (4) a tendency to resistive and disturbed behaviour not always intelligible as a reaction to her environment and which could not be swayed by reason. All four of these features disappeared after operation, from which the patient undoubtedly derived benefit.

CASE 294, a woman of 33, gay, bright, and outgoing, but sensitive, resentful of criticism, demanding of attention, narcissistic and dependent, was always restless, impulsive, wanting a change, and living for the pleasurable moment. She always dodged difficulties, and having once had a genuine faint at school, developed a habit of having 'black-outs' and 'dizzy spells' to extricate herself from distasteful situations. She ran through a whole series of jobs on leaving school, made a runaway match with a youth of 18, scrounged

cuity in the black-out came to be known as 'Flashlight Fanny.' Exhaustive reports kindly furnished by probation officers and the police show that the patient 'slept rough,' was the subject of complaints in that she would use the toilets in cinemas for doing her washing which she would then hang out on the radiators to dry, and was finally charged with persistently trespassing (in order to sleep) on War Department property. In all this there was nothing to indicate any psychotic state. She was variously described as an 'outstanding personality,' and as having 'a certain dignity that one normally does not find in the type of woman who . . .' The nearest to anything psychotic in the patient's behaviour were: 'One day I remember meeting her and she was wearing a jumper fastened round her waist with her legs through the sleeves, but in spite of this, she still walked with a certain deportment . . .' and '. . . occasionally she was to be seen wrapped in a fur coat, having no other clothing underneath whatsoever. . . .' Yet, such events seem to indicate only the sartorial *straits of a psychopathic female vagrant. After being charged with* trespass she was remanded to prison, at which she was very angry, and here she showed some signs of disintegration. She was very excited and garrulous, at times to the point of incoherence, she was obscene and threatening, reviled her father and hoped for opportunities for vengeance on certain people. She was certified from the police court. On admission to hospital the notes read: 'Defective judgment. No delusions, hallucinations, or obsessions. ? intelligence.' She was considered to be suffering from 'moral insanity' and to be dull and backward. In hospital she was irresponsible, provocative, and sometimes violent, swore fluently, was moody, and when ill-tempered would not speak; she was angry at her detention, and often querulous and self-pitying, while she would sometimes laugh for no apparent reason. Her sister could at no time detect any evidence of madness on frequent visits, though she had worked in a mental hospital. After 2 years the diagnosis of 'moral insanity' was changed to 'paraphrenia,' apparently because she used to complain histrionically that the ward sister would nag and flog her, that she had seen visions of her dead mother, and that she had various ailments such as rheumatoid arthritis and tumours, of which there were, in fact, no clinical manifestations. It appeared that these were the complaints of an angry and poorly-controlled woman who gained attention by picking up the complaints of other patients and abandoned herself to acting in accord with the caprices of the moment. At interview she was conciliatory and anxious to please,

aunt stimulated the patient to a quarrelsome irritability in much the same way that had resulted from the presence of the grandmother. This became extremely severe so that there was chronic and extreme friction, associated with which the patient became increasingly querulous, restless and erratic, bored and irritated by her work and by her home life, constantly talking about herself and about various minor ailments, between bouts of 'sitting and moping.' She complained that she couldn't sleep, which she attributed to hearing many voices which she said kept her awake. She insisted on seeing the doctor who had looked after her in hospital, and after an interview at the local clinic she was readmitted; this was 6 years after her first admission, and 1 year after the arrival of the (genuinely) troublesome old aunt. The patient had meantime been in a job as a maid and companion steadily for 3 years. On arrival in hospital she is said to have been importunate, to have made many demands for sympathy, to have stressed her hallucinations and her 'impulses,' as a result of which she was given a course of insulin together with some electroplexy. She was not notably improved, but on return home she resumed work and a life of pleasure, with the greater ease since the aunt had been disposed of in the meanwhile. She remained, however, moody, irritable, and dissatisfied; she drank to excess, was promiscuous, and given to frequent masturbation; she complained much of small symptoms, frequently took unnecessary quantities of aspirin and tonics, found no treatment was any good, and though she was a 'good-time girl,' she had no lasting sources of satisfaction nor settled plan for life. Three years later, and 10 years after the first admission, she declared herself increasingly 'fed up,' apparently in relation to an unhappy love affair. She said that the voices had become worse and that the impulses threatened to overwhelm her. The family, who had always thought her a malingerer, did not encourage her return to hospital, which she arranged, however, for herself. On admission it was noted that she was a 'chronic schizophrenic of long standing,' but also that 'the history is that of a sexually disinhibited and uncontrolled psychopath of inadequate kind.' 'I can't make anyone understand my illness,' she said, and after a fortnight, during which she felt that not enough notice had been taken of her: 'I wanted to throw tables and chairs about, and attack people. I used to be weak both mentally and physically, but I suddenly became strong, I didn't know what to do with my strength. I broke up a whole bed. I said to Sister, "For God's sake put me in the pads or in a side-room, or I'll throw the furniture about." And after I'd broken up the bed, they put me in the pads,

from relatives until they would tolerate her no longer, was sent the train fare to return home but spent it elsehow because she was afraid to face her parents. When she did return home she quarrelled much with an aged grandmother, smoked and drank to excess, and thought of little but her personal appearance. When the grandmother died, the patient (then aged 20) was thrown into some conflict between relief at the event and remorse that she had perhaps contributed to it. She helped to lay the grandmother out, during which she became, according to her mother, 'hysterical and agitated,' with faintness and vomiting. It was during that evening, according to the patient, that she suddenly developed hallucinations. For a year or so before that, she said, she had experienced the sudden entry into her mind and against her will of a single obscene word, which had been recurring in her thoughts again and again. But the hallucinations, if they were such, were something new. Her account of them was vague and discrepant. At the time, however, having laid out her grandmother, she became very emotional and spent a lot of time crying. She confided to her mother that she thought the prescription to put her right was to 'have a man.' She went to various doctors and hospitals, and the advice given was conflicting. Meantime, she developed 'all sorts of impulses,' and wanted to tear the hair out of women who sat in front of her in buses, to attack people, and to strangle her mother, whom she considered to be unsympathetic and bad-tempered. She was moody, self-absorbed, preoccupied with her impulses, and restless. To allay these symptoms she took to walking about a great deal (within conventional hours), and on one such wandering she asked a policeman if he couldn't get her into a mental hospital, explaining that she was keen to go, but that her mother disapproved. The policeman inquired about her symptoms, and after a kerbside consultation he said that he could grant her desires, and he did. She remained in the mental hospital for about 6 months, during which time she is said to have been quite well apart from some lack of confidence which caused her to retreat from difficulty to such an extent that she preferred institutional life to the necessity of going out and getting a job. On discharge she returned home and worked in a desultory way, went out with a lot of men, and drank a good deal. She said that she still had her hallucinations, though she could never describe what they were like or what they said, and still had her urges to attack people, but only women: 'I wanted to strangle them mostly, and to feel their dead flesh in my hands.' This appeared quite compatible with an outwardly normal existence, however, until the arrival to live with the family of an 80-year-old

to, and had started to save money for a holiday. She was inclined to take things for granted, was a little outspoken but not offensively so, and had too large an appetite, but now controlled a tendency to greed which she had first shown on return. She was much less spontaneous (for she had pre-operatively been very animated and chatty, with full rapport, and had shown a blend of the obsequious and over-familiar in a characteristically hysterical manner), said that she was far less emotional, and was no more troubled by 'hallucinations,' 'impulses,' nor by her bizarre complaints of which, though she remembered them, she said, 'My eyes? What's the matter with them? Oh well, yes, I had a lot of silly ideas. I don't know, perhaps I did believe them. . . .' A year after operation she was steadier still. It is true that she had changed her job twice, but one of those times she had been laid off. She had also changed her man friend. She made between £5 and £6 a week, and spent most of it, but her wardrobe had required replenishment. She had given up drinking and smoked only moderately. She was never out late. She was much more spontaneous, and gave an impression of a tranquil amiability, with capacity for enjoyment, but she had lost her over-enthusiastic pre-operative frothiness. In the home she was affectionate, good-natured, and even. Two years after operation she appeared an attractive, steady person. She was in the same job, and, unknown to her parents, engaged to the same man friend, for her marriage to whom she had managed to save some money. She had no symptoms nor signs of instability. She was appreciative, pleasantly spoken, and willing. Her weight (30 lb. above her pre-operative weight) was steady, as was her appetite. She had had no drugs in the 21 months since leaving hospital, and slept well. She had for some time enjoyed sexual intercourse with her fiancé, but was not apparently promiscuous. She had not resumed drinking, and had further cut down smoking as an economy. Her habits, like those of her fiancé who had evidently much influenced her, were steady, so that she appeared satisfied with no evidence of the boredom and craving for erratic excitement that she had formerly shown. This metamorphosis, and its progression towards increasing stability, was very striking. The key to the case seems to lie in the fact that the patient, despite appearances, was a warm-hearted and basically willing person, who had been for many years in conflict between two aspects of her nature which she had been unable successfully to harmonize. Her family had always been extremely fond of her, despite her vagaries and their necessarily frequent disapproval; in hospital, despite her troublesomeness, she had always been a favourite; socially she had

and something happened to me there. I had this sudden feeling, something snapped, something happened right across my head from here to here, and my eyes started to revolve like this (*rotating wildly*) and those voices went and I've never heard them again.' She appeared to revel in this state of disinhibition (it was noted that she was quite rational), and was quieted by continuous narcosis, on emergence from which she was still occasionally threatening, though amenable enough on the whole. She later became vexed because she felt that enough attention was not being paid to her symptom of rotation of the eyeballs, nor to some bizarre complaints that she made concerning her arms; and seeing her name on a list among the other voluntary patients, she impulsively took the notion to discharge herself, which she did. Meantime it had been decided that she should be operated upon, but she said she didn't care about that. She returned home, to the family's dubious pleasure, and responded to her mother's urgings to get employment by taking sulkily to bed. After 5 weeks of ill temper she approached her mother one day and said, after talking about her impulses to kill people, 'I've got to do it, and it'll have to be you,' whereupon she locked the front door and looked at her mother threateningly. The mother screamed, and the patient thereupon did nothing, but the family were by now eager for her return to hospital. She was readmitted 10 years after the first admission, 4 years after the second, and 5 weeks after she had taken her discharge from the third. During this fourth admission she was operated upon. Post-operatively she said that she still felt her 'impulses,' but that they did not trouble her, she was no longer concerned with her bizarre hypochondriasis; she was placid, even-tempered, somewhat indifferent and off-hand. She was discharged home within 3 months, and within 3 weeks of that had started a job. At first 'sometimes she's a bit inclined to be on the vulgar side, she says things, for instance, she shouldn't say at times (*swear words*), but nothing much. Sometimes she's a bit childish, doesn't quite act her age sometimes; well, she breaks wind in front of us, and then she'll laugh, not right for a person that age to laugh, is it? and then she says, "Why, that's nothing."' At first also she smoked and drank excessively, and didn't come home mostly till 11.30 and sometimes not till 2.30 a.m. But by 6 months after operation, 'She's just like [illegible] -pered, [illegible] er job, [illegible] had a [illegible] ped in the house spontaneously, cleaned the windows without being asked

intracranial cause this has been classed as a death due to operation.

(2) One patient, an aggressive psychopath, developed epilepsy for the first time after operation, but there are grounds for supposing that there was a special pre-operative liability to this.

(3) Of 3 inadequate psychopaths, 1 was much improved, 1 was somewhat improved, and 1 was slightly improved in that she was rid of her more florid hysterical symptoms, which showed some tendency to return, however, over 2 post-operative years. The degree of improvement ran approximately parallel to the worth of their personalities viewed in terms of social conscience.

(4) Of 2 aggressive psychopaths, 1 is of special interest as having shown a fully-developed schizophrenic psychosis within a year of operation (CASE 293, page 417), and the other, though showing post-operative epilepsy, was slightly easier to manage while under hospital care.

(5) Of 2 schizoid psychopaths, so called (despite their having shown much warmth of affect and good rapport) because they had shown schizophrenic features at times, 1 showed great improvement considering the original material, and the other showed a degree of improvement that was quite remarkable (CASE 294, page 423). In both instances this appeared attributable to their being basically willing personalities though burdened with affective excesses which they could not control.

always been popular; at school she had been viewed with affection by teachers and schoolmates alike, and many of them had kept up with her. Patients in the same hospital always asked after her with kindly interest when visited by the writer, and many of them wrote to her. While she was not considered by the writer to be schizophrenic, nor by the family ('she was always so sensible, all the time, we couldn't help feeling she was putting it on, still, it's so nice to see her better'), but essentially a psychopath with some features verging on the schizophrenic, her case did not present the appearance of wilful bad behaviour so much as of having to control more than she could manage.

Thus, out of the 7 surviving cases of psychopathic personality, of the 3 who were classified as inadequate, all were improved in that their florid symptoms disappeared; 1 was much improved, 1 was given the independence to enable him to bilk his marital obligations in unheroic fashion, but himself was further symptomatically improved thereby, and another remained an inadequate psychopath less overtly hysterical than before. The improvements ran approximately parallel to their personalities, in that the more they showed a combination of drive with willingness to participate and co-operate with others, and to subordinate themselves, the better was the outcome. Of the 2 aggressive psychopaths, 1, a girl of 16, became schizophrenic within a year, and the other, though somewhat easier to manage while under care and a less violently disturbing social force, was virtually unimproved. The 2 so-called 'schizoid' psychopaths (and the word is here used not so much to denote aloofness with lack of affective warmth, with a tendency to the autistic and to withdrawal from competition, as because they showed some features with a rather schizophrenic stamp during the more florid phases of their disturbance) both showed very marked improvement, and in each case this seemed to be achieved by the reduction of affective excesses which they had not been able to control.

Summary

(1) Of 8 psychopathic personalities, 1 case died after a few days of coma which developed 6 weeks after operation. Permission for autopsy was refused, but as the patient died from

said that they drank to cheer themselves up, among other reasons, but this was not more than a very partial truth, for they habitually did so in the absence of any depressive mood, and they showed no inclination to abandon the habit. They were unreliable witnesses, casual and off-hand, ingratiating in manner and plausible in speech.

Case 284, a pert and attractive woman of 35, said, 'Well, if I felt frightfully energetic I might get up at 7 and make some tea if my hands weren't too shaky. Then I need a drink before I can get dressed, that's definite. I have two or three, and I'm not very keen by then on dressing properly, I put some slacks on, go to the car, and proceed to do the day's ordering, which consists of a bottle of gin and a hundred cigarettes and changing the library books. Then I need a drink and go to the Metropole. They open at 10.30, and I'm usually there by 10.35, I stay half an hour, or longer if there's anyone there to talk to, then I go home. I have lunch if I've remembered to order it, but by then I'm probably in desperate need of a sleep, so I say I've got a headache, which doesn't kid anyone, and I go to sleep till about 5, but it's not proper sleep, and then I have another drink, and if I'm going out with a man, I get dressed and go out. I invariably get into trouble then, some sort of scrape, I quarrel or say the wrong thing, or mention someone to the wrong person, or something like that, and after that I come home; oh, yes, they come too; oh, yes, I sleep with nearly all of them. I don't know why, but I don't think I like married life. Well, I think my husband's a very nice man, very handsome and extremely wealthy, but I don't know that I could stand that much of him. I don't know what he thinks of me, but it can't be much as he's had to put up with what he's had to put up with. Well, I suppose I'm still living with him, I'm not divorced and I'm not separated, he comes down to lunch on Sundays, but it's mostly to see the child. Last Sunday I slept with an arch-enemy of his, I don't know why, I think I wanted to get my own back on Leonard. Of course, I was very tight, I don't think I'd've done it on Sunday night if I hadn't been, I'd've waited till Leonard had gone on Monday. Oh, there was a frightful row next day, Leonard gave him a hiding and threw him out. I went down after him, I was going to steal the car and go off with him, but Leonard followed me down and brought me back. By then I *did* need a drink. He made me swear that if I left it would be for ever, but he always does that, and I said I would if he'd let me phone for a car. So I did, but I hadn't any money and had to send the chauffeur

CASES OF DRUG ADDICTION

There were 5 patients who were addicted to drugs, and who were operated on on that account. In the first case so treated there had been the dual object of rendering a patient of erratic and fluctuating moods more affectively stable, in the hope that such would reduce the patient's need for 'auto-chemo-therapy' in the forms in which she used it. The result was successful. As knowledge of this became diffused around, the emphasis came to lie on the cure of the addiction rather than of the affective disorder, and as the potentialities and the limitations of the procedure were understood even less then than now, operation was tried as a last and desperate experiment in 4 other cases of drug addiction.

All 5 patients were women. Two were addicted mainly to paraldehyde, 1 mainly to morphine, and 2 chronically to alcohol. In 2 of the 5 cases the treatment was successful, and in 3 of them it was not.

The usual difficulty in gaining more than a superficial understanding of the underlying causes of the addiction was, of course, encountered in these cases. All of them were dissatisfied people, and in each the addiction represented a means of gaining satisfaction. Yet there were differences. The differences were apparent chiefly in the extent to which the patients tolerated their frustrations. Three of the patients made no efforts at all to bear dissatisfaction without recourse to anodynes. Their addiction had therefore become habitual, and was accepted by them as a matter of course. This was in line with the pattern of their lives as a whole. They were grossly egocentric and conducted themselves with a view only to immediate gratifications, and they had done so, if not from birth, at any rate for very many years. They were thus entirely selfish. They had no qualms about their behaviour, over which they felt neither self-criticism nor sense of shame. It was thus noticeable that, on discussion, they did not make excuses for their acts; they appeared not to feel that there was anything to be excused. They did, on the other hand, give reasons, and the reasons were either inadequate or untrue. These 3 patients all

the patient had 'broken it to bits. She never mothered her dollies, she'd get frightfully angry with them, would keep scolding them, and then she suddenly started a hospital and she'd have them all in bed with the most awful diseases, it would make our flesh creep to hear her.' These traits increased from 8 years onwards. 'She always wanted her own way, and she's always been very jealous.' This was especially so of her parents' affection for each other. She was fond of interrupting them when they were talking, and would say, 'Oh, you two don't want me, you have each other.' She was not fond of anyone or of anything, but was very aggressive. 'If she didn't like anyone, nothing would make her be nice to them. She'd be horrid....' 'She didn't have very many tantrums, but I think that was rather because I rather wore myself out keeping things from coming to a head like that.' She was not moody unless something special happened to upset her, of which the commonest cause was jealousy. She canalized her aggression by taking up nursing, in which 'she'd either do too much or too little, nothing was the happy medium. She'd be so kind and seem so affectionate one time, and the next she'd be so different.' After managing somehow to complete her training, she got into trouble for having sold furniture while buying it on an instalment system, had difficulties with moneylenders, and then unexpectedly arrived home, where she concealed the fact that she had been released on bail (having been charged with theft of some money) by saying that she had a few days' leave. She was bound over and it was probably at about this time that she started to take drugs, especially morphine, allegedly to relieve pain arising from some abscesses with which, determined to 'stay on duty till the last,' she had refused to report sick. She then took to having a small dose of morphia to promote sleep during the day after a night on duty, and she found it necessary also for 'relieving the strain' of her work, enabling her to cope with night duty, and allaying any worry that she felt lest her colleagues might learn her secret. 'She never kept a post 12 months, she'd be got into a job, and then she'd let them down in a few weeks.' While out of work she one night burgled the dispensary of a hospital in which she had done her training, and when the staff arrived next morning, almost the whole stock of morphine, heroin, and cocaine was missing, and later found in the patient's possession by the police. She agreed to enter a mental hospital, where she stayed some time; she claimed later that she had taken a lot of heroin with her, concealed in her hair which she had had specially curled for the purpose, and large quantities of morphine

to pawn my watch, and I bought a bottle of whisky. Later I phoned Nanny to ask if my husband was still there, and he wasn't, so I went back, and I got dressed properly and then I went out; oh, yes, with the same man that Leonard had thrown out. Well, no, I don't have much to do. My husband thought it'd be a good idea if I took up cards and played small poker. Instead of going to the nicest club I went where I knew the real gamblers. I'm very good, but not against card-sharpers from London. Leonard settled at the end of 3 weeks, it only lasted that much, in fact it didn't last that much, but I've got a habit of writing out cheques that Leonard has to meet. Oh, I don't know how much it was I lost, some hundreds of pounds, I suppose. I always do pick up the wrong men, never the right one, and they always land me in trouble again. Either they're crooks or something, and then, of course, someone always tells Leonard. Have you got a cigarette? Thanks. Oh, yes, I smoke a lot, officially 40 a day, but actually it's usually 60 or more, and if I don't sleep at night it's more still. I never do anything in a small way. I should say I drink about a bottle of whisky a day, not always whisky, sometimes gin, and I drink a lot when I'm out. Oh, that's been for a good long time. My father had a business; when he died they thought it'd be a good idea for me to manage it, to keep me out of mischief. But it didn't, it got me into more, and we had to get rid of the property or there wouldn't have been much business left. We spent it all, just my sister and me. Then, I think, I was 28 and she was 27, when I didn't have a guardian any more; he got a power of whatever you call it to hand our money over to us, and he relinquished his guardianship, he was very pleased, he'd just about had it. And it was lovely for us, I had a gorgeous time. Oh, we spent it. Well, I should think it lasted about a year. I got married then, and I have to depend on my husband now. . . .'

CASE 285, a lumpish and towsled, dirty woman of 39, was the only child of a psychopathic father who 'felt he always had to make himself disagreeable before anyone would notice him.' Her mother was a poetess with second sight. The first real difficulties do not seem to have been met until the patient was 8 years old, when, having come in one day eager to impart some confidence to her mother, she was much vexed at being obliged to postpone this owing to the presence of a neighbour, and made a scene. 'It seemed to be after that that she was so difficult.' 'She became most untruthful, we never knew where we were.' But even before that time the patient had been consistently destructive; her father had made her a doll's house, and her mother had furnished it, but within a week

but which would be interrupted by random periods of social activity, often resulting in motor accidents while inebriated. She had various admissions to hospital, where she would arrive half-intoxicated and reeking of methylated spirits or of the perfume which had afforded her a last swig *en route*, and where she would lead a placid existence with no apparent craving for alcohol at all, except once when (though she persisted in denying it) she took a good stiff dose of methylated spirits on learning that she hadn't got a job for which she had applied.

None of these 3 patients was improved by operation. CASE 284, who had said, 'This operation has been suggested, and knowing me I must have it right away, or I'll go away and have a few drinks and change my mind, and be somewhere else to-morrow,' responded well at first to the encouragement and payment of much attention which she received in hospital. This did not last. She resumed her habits on discharge, and became increasingly difficult, irritable, and turbulent. She showed some deterioration on an alcoholic basis so that it became possible to certify her and she is now a certified patient. CASE 285 returned home, where she was even more erratic and less controlled than before. She was more indolent; she might do excessive amounts of housework on one day, but then hardly any for a week. To her parents, whom she had always regarded unjustifiably more as her critics than her allies, she was more disagreeable and more unpleasantly outspoken. She neglected her hygiene and personal appearance, could never be relied on, and was in general even less predictable than formerly. On one occasion, having gone out for a walk, she returned home without a skirt, which she had left *en route* at the cleaners. Various vases, clocks, and *objets de vertu* disappeared; they had been sold or pawned to get money to buy cigarettes. She toyed with the idea of getting a job, was given money to buy the necessary overalls but spent it on other things, finally worked for a week and didn't like it. At some time or another she again started to buy medicines; when or what are uncertain, but the one of choice was probably chlorodyne, of which she had formerly been accustomed to take 8 ounces a day. She was persuaded to return to hospital as a voluntary patient, but she ran away; on returning again she felt she was victimized and discharged herself, and arrangements were finally made for her to

which she had pulverized and put into a box which passed as containing talcum powder. 'Dad had a nervous breakdown over me, the police business really got him down, he got suicidal and he came here, but he was only here about 5 weeks and got right as rain. It was an awful do that, the family really thought it was the end of the world, and mother played Hamlet. It was a disgrace, of course. But taking morphia, I could have nursed anything, and I think I could've carried on and led a normal life on 1 grain a day, but it was hell if you couldn't get it. It really is, cold sweats, feel you're going to suffocate, can't lie still a minute, you can't eat a thing, and have dreadful diarrhoea. It used to be awful, but I wasn't as crafty then as I am now. . . .' After her admission to the mental hospital, special work was found for the patient in sheltered circumstances, but, though she could get no morphine, she would stagger on duty reeling under the effects of medinal and trional, while a number of thefts happened soon after her arrival (many of them from patients), and ceased after her departure. She was admitted to a mental hospital again, (*where drugs were now found in her hair,*) and behaved normally enough apart from being occasionally on her professional dignity when, for instance, she did not want to conform to the routine, and apart from habitual stealing, usually of cigarettes. She did not appear to regard this as theft, though she made no attempt to repay what she took; she would explain blandly that she hadn't got any and needed some, as it was rather difficult to do without. (She had told the writer that she did not smoke.)

CASE 286, a woman of 24, a thief and pathological liar despite many social, educational, and financial advantages, started to become 'a good-time girl' at the age of 18. The earlier history is unobtainable, as the only knowledgeable witnesses have died, and the patient's account is unreliable. She was exceedingly friendly and candid on the surface, but much went on in her mind that was not known, while no sort of reliance could be placed on anything that she said. She drifted half-heartedly through a series of jobs, of which she drank such profits as there were. When she ran out of money she would use her social position to browbeat the tradespeople into supplying her with alcohol on credit, would cadge from the servants, and would then take to drinking methylated spirit and scent. She liked to get up late, and any energetic activity was alien to her nature. She knew many undesirable people and became half-heartedly and indecisively engaged to a crook. Her figure, facial appearance, and costume all progressively deteriorated as she took to a life largely spent in bed, semi-stuporose from Algerian wine,

tion, dissatisfaction, or impending discomfort, whether physical or psychic, they took their anodynes; they regarded it as natural so to do, and they had never felt themselves called upon to show endurance; though they lied about their activities in a protective sort of way, they were unmoved and unashamed in face of detection; they were as cheerful as anyone who leads a life of that sort can be, and such sufferings as they experienced were the result, rather than a cause, of the addiction. They were ill only in so far as gross indulgence may be considered a form of illness. The 2 cases that we are about to consider showed, on the other hand, something more than mere indulgence. It is true that they lied and were cunning over their addiction, showed psychopathic traits, and reduced their dissatisfactions and frustrations by indulgence in alcohol and in narcotics. But these were patients in the literal meaning of the word; they were people who suffered, and it was that which, to a considerable—at any rate to a much greater—extent, led them to the addiction. The addiction, in fact, was more rather than less symptomatic in these next 2 patients, whereas the first 3 cases had experienced no symptoms worthy of the name until the addiction had become established.

Case 287 was a married woman of 56 who had lived all her life at a high emotional tension. In conversation she was highly coloured and romantic. She was the second of 5 sibs, 'marvellous people,' who were the children of 'wonderful parents, father was perfect, his letters were an inspiration to everyone, I used to read them to my friends. . . .' Childhood and home life were happy, apart from a 'very vivid imagination, which has been the ruin of me. I'm highly strung, of course, doctor, very highly strung and always have been . . . it started when I was quite young, when I first had my periods, I was the calmest person there ever was before. My mother used to have those old-fashioned horrible at-home days, and my sister and I had to go in and see the guests after 5 o'clock. I'd go to the drawing-room door and stand there absolutely in a state of terror at having to go in, I'd flush and my face would be all red. Now I could face the King, though, of course, not just at this moment. . . .' She became a schoolmistress and continued to teach until the age of 32. During this time she showed some neurotic symptoms, such as a 'desperate homesickness, I didn't know what to do, the idea would come into my mind that I must go home, but it was a good job, it was a big job, and I adored it. I used to fight and

enter another. She lives there placidly in an empty sort of way, and when seen 2 years after operation she had just stolen 5 shillings from a shop when taken by a nurse on an expedition into the town. She had always been able to do without drugs quite easily when living under supervision. Though it is probable that her tendency to addiction was reduced by operation, in that during the 4 months that she was at home she must have taken less than before and less obviously, she cannot be said on the whole to have improved. CASE 286 showed only two slight changes: she was post-operatively rather less easily influenced by other people, through a general reduction in her sensitiveness which helped her also to be less irritable at home: and she gave up methylated spirits. Otherwise, though she said very calmly that now she never touched a drop, she continued much as before, with Algerian debauches in her bedroom where she furtively smuggled her supplies, and admission to which she imperiously refused even to the servants. Advantage had therefore to be taken of any prolonged departure from home in order to clean up and remove the empties. One day, when she was careless enough to be caught red-handed in the hall staggering under the weight of the bottles she was taking up, she met an inquiry with a bland denial that they contained any alcohol at all. Efforts at rehabilitation had failed, as, though she professed interest in the work found for her, she stole money, was a bad influence on her associates, and left after a scene. She has become fantastically over-weight, increasingly sluttish, and is now (at 23 months after operation) again in hospital. Thus, all these 3 cases may be considered in some respects worse than before; in the 2 alcoholic patients it is doubtful how far the operation may have contributed to this deterioration, if at all; in the patient addicted to morphia, heroin, cocaine, and to whatever she could get as substitutes, there was some reduction in the intensity of the addiction and in the determination with which it was pursued, but there was accompanying exaggeration of her psychopathic traits.

The other 2 patients did better. They were, if one takes a total view, quite different despite points of similarity. Our first 3 cases, as we have seen, lived essentially for themselves; they were blandly self-indulgent; they sought always immediate gratifications without bothering to look beyond; at any threat of frustra-

things than a normal person would, things would get on her mind, prey on her mind. She always took a tremendous lot out of herself, whatever she did; she lived on her nerves....' She became much concerned over her loss of weight and her sciatic pain, kept on consulting doctors, developed headaches, and complained that she could not sleep. 'She was very talkative,' said one of the doctors, 'and always on the jump. She was very sort of social, playing bridge every afternoon and rushing here and there, and she was always thinking there was something wrong with her and rushing to one doctor after another, awful headaches and insomnia, that sort of thing. She'd been taking hypnotics for ages and couldn't give them up, and that worried her. She'd say she must go away for a week or she'd go crazy, and then she'd be all right for a week, and then everything would be wrong again. She'd tell the most awful stories about people, and what made it worse was they were almost always true. She was a pleasant person really, very hospitable and all that, but as a patient she was a menace.' She continued in much this sort of way, and over the years from 1942 gradually increased her amounts of paraldehyde, starting with two doses at night instead of one, and taking additional doses at times in the afternoons. In 1945 she felt acute dismay as, with the end of the war, her social life again began to return to its former restricted form. Things became dull, and she longed to have back the hectic excitements that had beguiled her from her neurotic symptoms. She became dissatisfied and restlessly depressed, bored and eager for escape from boredom. She dissolved the tedium of this reality with more paraldehyde, and escaped in addition from her headaches, restlessness, and various pains. So, in 1946, in a somewhat fuddled state, she fell by accident into a pit, and sustained multiple abrasions which became septic. This involved her further in invalidism and insomnia. Her health had now become the nucleus of her life, and she concentrated, of course, on such physical symptoms as she could muster, over which —and especially the insomnia—she felt a genuine anxiety. In the spring she and her husband were due for a long holiday which they had not had for many years, and they travelled abroad to see relatives and friends. The patient somewhat improved, but unfortunately the return journey, which was made under very difficult conditions and was lengthy, together with the prospect of resuming life as a commoner where till lately she had been a queen, again upset her. She took not only doses, but overdoses, and became sunk in coma. And after return she kept ordering new bottles of paraldehyde, saying that the old ones were broken. By now she had become

fight the homesickness . . .' while she had a long period of despondency after the marriage and removal to a distance of her elder sister to whom she was deeply attached. 'Anaemia and insomnia' were diagnosed, and the patient embarked on a course of potassium bromide with which she continued more or less for the next 30 years. At 32 she married a man for whose return from abroad she had been waiting for some time, and the marriage was successful despite various further neurotic symptoms. She was, for instance, for some time obsessed with the fear that she was going to grow a moustache, and with feelings of inferiority on comparing herself with her sisters-in-law. 'They're different, they're very clever women, I've never got on with them very well, and they sort of haunt me, they worry me when I'm off colour, and sometimes I feel they're right there beside me; oh, no, not so that I can touch them, I try not to let myself see them. But I'll be golfing, and suddenly it'll come into my mind, "Well, Tom's sisters . . ." and then I think of that homesickness, and those fears about the moustache.' She received much support from a strong, stable, and affectionate husband, who did much to check her neuroticism, so that, despite bursts of insomnia, she lived happily: 'I'm a terribly jolly person, I do everything, captain of the golf club, cycling, done some acting . . .' and she was, in fact, popular, house-proud, sociable, and a good hostess, devoted to her husband and son. A doctor friend of hers, staying in her house one time, prescribed some paraldehyde for her insomnia. 'This wretched paraldehyde,' said her husband, 'she'd been having it for 14 or 15 years, but then it was in the prescribed doses.' During the 1939–45 war their home town became a place of strategic importance and the patient revelled in the change; as her husband said, 'She was absolutely in her element during the war.' She ran various organizations for the troops from which she won much prestige with, ultimately, engraved silver salvers and other forms of public recognition. She became over-busy, and, always sociable, she grasped with both hands the sudden expansion of her social life. 'Why,' she said, 'I became the social hostess of the place. Seven generals never out of my house, and I was never out of their headquarters. It was wonderful.' She burned the candle at both ends. In 1942 she developed a febrile illness, with which she became quite bad, and the sciatic nerve received one of the injections with which she was treated, which led to persistent pain. Shortly after this she developed pleurisy, and at the same time began to lose a good deal of weight. 'She's always been highly-strung and imaginative,' said her husband, 'she exaggerated things, made more of

being widowed, an alteration in her professional status, a change of country, work in not very congenial company, air raids, etc., and as she had at first treated herself with alcohol and later with paraldehyde, she became increasingly unable to do without one or other. Not only did she deteriorate under their influence, but she was frightened by her own deterioration, and she entered—after various attempts at cure which were but partially successful—a long and fluctuating depressive state characterized by agitation, suicidal attempts, and self-pity. She became post-operatively a phlegmatic, indeed, a vegetable, person, who none the less managed to work in a limited way and to scratch a living, kept her friends, and contrived to make reasonably good company. She was much less colourful than before, showed small initiative, and required some stimulation, but she was not a problem and she neither needed drugs nor took them. 'You can give her paraldehyde on a tray,' said the doctor, 'and she won't touch it.'

Thus, out of 5 addicts, 2 were relieved of their addiction at some cost to their highly-coloured and emotional personalities, which had themselves been powerful factors in the development of the addiction. The other 3 patients had been shallow people without identifications, who had all their lives pursued a policy designed to gratify their own immediate wants, and without regard either for the future or for other people. They continued to be addicts. The relieved patients had used the drugs to alleviate some actual distress, and had shown some semblance of judgment before the state became out of hand. The unrelieved patients had had none but the most trivial, if any, symptoms, and had taken their drugs intemperately without regard for the consequences.

Summary

(1) There were 5 cases addicted to drugs. One was addicted to paraldehyde, 1 to paraldehyde and alcohol; 2 were chronically alcoholic; 1 was addicted to morphine, heroin, or cocaine, or any other substitute that she could find.

(2) All patients were women, and all were psychopathic.

(3) The 3 who were the more psychopathic and who took the drugs for the indulgence rather than for any other reason, were not relieved, and in some respects were post-operatively

really demoralized, restless, and frightened, with depression which caused suicidal preoccupation. She gave up all her activities and took to a life in bed. Actually unable to do without large doses she displayed much cunning. She began to deteriorate and became all but unmanageable. There were attempts at treatment in which she would try for a time to co-operate, but, ashamed of her addiction, she tended always to emphasize the more physical aspects of her symptoms, or alternatively to distract attention by exaggerating the disabling nature of her obsessive-compulsive thinking. She finally came to operation in a tense, worried, agitated state, in which she was intolerant of noise, easily startled, and, though with many difficult characteristics, genuinely distressed. Post-operatively she lost both her tension and her hypochondriacal preoccupation. She became again cheerful and more extraverted. She found it rather difficult to understand why she had felt such a load before, and looked forward to returning home and resuming her old life, which she did. When seen 2 years and 2 months after operation, she was indolent without desire to exert herself in any form; she was less vivacious; she had never regained interest in her house and its upkeep to her former extent; she was rather less affectionate and demonstrative. She no longer played golf or bridge, and walked only occasionally. Her interests were less highbrow, and she spent a great part of her time in reading detective novels. She was in general more primitive, but she was still fond of company and was popular, and she was quite a possible person with whom to live. She had shown improvement over the 2 post-operative years in that for some 8–9 months after operation she had tended to be easily irritable, and had been noticeably automatic (e.g. singing or humming, as do many patients, the same few bars of a tune over and over again), but she had gradually shown diminution of both tendencies. From the time of operation onwards she had taken no medicines of any kind, nor had she expressed any desire for them. She had thus overcome a habit of 30 years' duration.

The other case was not much dissimilar. The patient was an emotional and erratic woman, who had none the less kept herself within bounds sufficiently far to gain a professional qualification and to do some sustained work of high quality. Always moody, however, she was unreliable, and tended to be swept away by the vagaries of her temperament. Between whiles she was capable of a certain charm and of thoughtfulness for others. She reacted unfavourably to certain basic changes in her life, such as

MENTALLY DEFECTIVE GROUP

While a number of patients in this series was dull and backward, there were only 7 in whom it was felt that intellectual handicap played any decisive part in the development of that state of affairs which brought them to operation.

A 15-year-old female idiot, the subject of intense maternal affection, was operated on in the hope that some reduction of her destructiveness and noisiness might follow, with the result that she might become an acceptable member of her home circle. The child could not speak, made animal noises, was unable to do anything for herself, was very difficult to feed, and was wet and dirty. She struck herself often, sometimes bit herself, tugged at her own nipples, and was especially liable to these actions during frequent phases of irritability, during which she would strip off and destroy her clothes or the bedding and might pitch any portable furniture out of the window. Between whiles she would walk aimlessly about, eating leaves or grass if available. Attempts at examination caused the patient to hide her face in her arms, to be excited, violently resistive, and to make noises of distress. Her worst feature was a habit of screaming again and again and again, in piercing tones which bored through the other patients' heads, awakened anybody within earshot, and which could be heard at a distance of several hundreds of yards. For 6 months after operation she was markedly easier to nurse in that she could be dressed without destroying her clothes, and stayed dressed; she no longer threw things out of the window nor butted her head through panes of glass, while her screaming was not only less frequent but of a different timbre, so that it could be borne by the tolerant, with the result that the patient could be taken out for exercise without complaints from the neighbours. Twelve months after operation, however, she had regressed slightly in that she was again destructive of clothing and furniture, though to a lesser extent than formerly. By 2 years after operation her screaming was still subdued and tolerable, and she remained less destructive than she had been, though she often struck herself or anything in her environment during her irritable moments.

worse, though the continued addiction was largely responsible for that in 2 cases.

(4) The 2 who were less psychopathic, and whose addiction had developed from an original attempt to relieve some definite distress and had not been the result of a mere indulgence, were entirely relieved of their addiction, and have remained so for more than 2 years. As people, they are both less than what they were, but the gain in each case has quite outweighed the loss when the pre-operative state and the prognosis in absence of operation are borne in mind.

moods allowed her to make their effects more subtle and widespread, though less wildly dramatic, and arising from her habits of pilfering and tormenting, there would be daily disturbances of the ward harmony, with major scenes about twice a week. By the end of a year the enormous appetite had diminished, the weight was returning to normal, the patient knitted, went to the cinema and to dances, worked in remote parts of the hospital, and was allowed dual parole in the town. This increased freedom gave better outlets for her aggression, she pilfered less, did not need to steal food, but she was still exceedingly tiresome when provoked by trivial frustrations, though well enough for her discharge to outside employment to be seriously considered. In the second year after operation she began gradually to deteriorate; an occasional post-operative incontinence, which she had overcome, reappeared, and became more frequent; she became dirty in habits also; she would spit at meal times; she had again taken to smashing windows once a week or so; she was destructive and assaultive; her conversation was less coherent and she seemed unaware of contradictions in what she said. She had also developed the notion that a mouse was concealed in differing parts of her anatomy. It was this mouse, she declared, which was responsible for her incontinence. Its needs also determined much of her activity, so that she took less or more food according to the mouse's state of health, and more or less exercise according to the mouse's energy or fatigue. She had ideas of reference and believed that people talked about her. She became increasingly withdrawn and preoccupied with her own thoughts, to the exclusion of interest in her personal appearance. In fact, she was gradually developing a schizophrenic psychosis.

A mentally defective woman of 35 who had been in institutions from the age of 15, appeared pre-operatively to be schizophrenic in that she would scream to herself without reason, talked to herself, postured and grimaced, pointing to things that other people were unable to see, would unexpectedly push her hands through glass panes, and would hold no sensible conversation. She spent most of her time muttering, laughing fatuously, and going into peals of mirth whenever she saw herself in a mirror. At other times she would be quieter, addressing herself by name in self-depreciatory terms: 'Silly Hettie, ugly Hettie,

The lives of her associates were thus rendered pleasanter, but the net gain was small and the patient remained under care.

A girl of 20, with a mental age of under 9 years, who reached percentile 5 on Raven's matrices, had gone to work in á factory on leaving her special school. She there threw acid over another girl in a fit of temper, was placed under supervision by court order, absconded twice, and was then committed to a mentally defective colony. There she became aggressive, violent, and destructive when thwarted, and was liable to continue in such a state for days on end. She was transferred to a mental hospital, where much personal interest was taken in her and efforts were not spared to educate her in social behaviour. She became able to maintain a tolerable level of conduct sometimes for 8 weeks at a time, but this would be interrupted by spells of violence, smashing the windows, tearing up mattresses and clothes, attacking the nurses, etc. Trivial incidents, such as when someone failed to say 'Good morning' in a manner which appealed to her, would be enough to evoke a fit of the sulks in which any other minor provocation would lead, with cumulative effect, to the appearance of furious rage. After operation these extremes of behaviour were reduced. The patient gained 21 lb., was slow but willing, slept in an open dormitory without observation, attended the cinema without supervision, neither smashed nor felt she wanted to, worked well, and was in general more placid. So far this might sound a good result, but it had its debit side. She had a large post-operative appetite, to assuage which she took to stealing food, and being successful at this as well as less restrained than before operation, she took to stealing anything she coveted (other patients' property, hair-ribbons, etc.) regardless of detection, and she tried to pick the locks with hairpins. With this lack of restraint, she talked more loudly and ordered people about. Further, the fact that she was not swept so turbulently to such peaks of rage allowed her more time for reflection, and now instead of herself developing a wild fury, she vented this less intense aggression on other patients, nagging and tormenting them by saying that they were mad, dirty, lazy, greedy, etc. By this means she skilfully worked them up to a high pitch of indignation, after which she emerged as a suffering martyr when they finally set about her. In fact, the diminished violence of her

A similar case, that of a man of 40 who was congenitally mentally defective and had been admitted and re-admitted to a mental hospital annually since the age of 21 (except for 1 period of 4 years, during the whole of which it was agreed by all that he was not fit to be at large), showed a more successful result. He has been transformed from a brutish lout who kept his over-affectionate parents in a state of chronic uneasiness into an amiable and equable person who has lived in full harmony with his relatives for more than 2 years. He showed an interesting example of altered affect in that pre-operatively he always had to withdraw in the presence of visiting strangers owing to a habit of bursting into tears; post-operatively he also had to withdraw but for the opposite reason that he was unable to avoid laughing at them.

A woman of 35, mentally defective and with a hemiparesis secondary to a birth injury, had had psychotic symptoms from the age of 21, in that she believed herself to be followed in the street by people who intended her harm, half suspected plots in innocent actions, would become unexpectedly frightened in all sorts of situations, would snatch anything red away from people whom she knew (without explanation), and vaguely believed the whole public to be against her. She managed, however, to carry on with domestic jobs, which she frequently changed, until she formed a grotesque attachment at the age of 32 to a youth of 21 who jilted her. She then entered a semi-stuporose state, sat with her eyes tight shut, required to be fed, would not look after herself in any way, and at times showed flexibilitas cerea. She was always responsive to electroplexy, after which she would become clean and tidy and comparatively communicative, but she always relapsed. After operation the chronic discontentment with mistrust of people which had been the keynotes of her life were replaced by a smiling amiability and a placid acceptance of her environment. She put on 57 lb. in course of 12 months and became much too fat. She helped readily in the ward, but required prompting and some supervision in her work and in that respect she had not returned to her pre-operative level. She was, however, orientated and in touch with current affairs to some extent, appeared free from distortions of content, and said that she felt in general much better, which she attributed

daft Hettie. . . .' She was wet and dirty, would not look after herself at all, but was not resistive except that she was very destructive of clothes and bed-linen by slow and determined picking. She was always disorientated in time, and when asked how old she was and how long she had been in hospital, she would answer, 'The same age as myself,' and, 'As long as I have.' Always bearded, after operation she became increasingly hirsute. She put on a great deal of weight, she was no longer destructive, nor was she faulty if efficiently supervised. She even attended sewing classes with other patients, and though she did little, she did something. She was smiling and benign, indifferent when her drawers fell down, but she was quiet, moderately active, seemingly happier, and far easier to nurse.

A dysplastic, gawkish girl of 29 with a hare lip and cleft palate had been in various mental hospitals almost continuously from the age of 14 onwards. She had always been backward in development and in education, was unable to stay in jobs, would wander away from them and from home, and when in hospital would frequently escape. In course of these wanderings she had been certified as mentally defective. She was liable to periodic phases of schizophrenic behaviour, varying between an apparent vacancy of mind with muteness and resistiveness and episodes of impulsive violence with destructiveness, grimacing, wild laughter, and double incontinence. These occurred irregularly and were of variable duration. Between them she showed herself to be a very simple, childlike, and dependent person, conscious of her intellectual and physical handicaps to which she was unable to make any satisfactory adjustment. After operation her behaviour continued in modified form; she still tore bedclothes, destroyed blankets, scratched the walls, and was bad tempered and nasty in an unpredictable way, but these phases were both briefer and less intense, while she ceased to smash, was less quarrelsome, no longer tried to run away, was clean in habits when supervised, did a good deal of ward work, and was in general far more contented so that she began to take a pride in her personal appearance and was on much pleasanter terms with life. This improvement has been maintained over a period of 2 years. She is not, however, sufficiently manageable to live outside an institution.

would have precipitated her straight back into hospital, for her daughter had contracted a forced marriage with a good-for-nothing lout. The two newly-weds naturally resented the patient's presence. They were unkind to her, sometimes to the extent of being brutal. This treatment wore the patient down after a time, so that some 15 months after operation she made 2 suicidal attempts, by cutting her throat with a razor blade and by drinking a pint of lamp oil. She seems at the same time to have entered a mixed state of depression with manic features in which her post-operative lack of restraint became more obvious. She became excited, over-talkative, and restless; she made erotic advances towards her favourite son; she heard auditory hallucinations which made obscene remarks as a result of which she would ask the bawdiest questions of total strangers in the street; she aggressively threw water over some children who annoyed her; but she was also dejected, wringing her hands and worrying, and repeatedly expressing fears that she would be sent to jail. In hospital she rapidly settled down again, and seen there 2 years after operation she was much as she had been when at her best at home, though the supportive hospital régime caused her to work more steadily, to take trouble over her appearance, and to avoid her former eccentricities of personal hygiene.

Thus, in this little group of 7 mentally defective patients, whose intellectual handicap contributed to the state of affairs which brought them to operation, we have the following results:

(1) The more tiresome features in the behaviour of a 15-year-old female idiot were reduced so that she became an easier nursing problem.

(2) Gross swings of mood with aggressive violence in a defective psychopathic girl were markedly reduced so that within a year of operation—after 2 stormy years in a mental hospital—discharge to outside employment was being contemplated. She then began to deteriorate, however, coincidently with the development of a schizophrenic psychosis.

(3) One grossly defective and chronically schizophrenic patient showed marked improvement in conduct so that she was much easier to nurse.

(4) Two cases with irregularly but frequently recurrent schizophrenic episodes, who became as nearly normal between

to the operation, though she had otherwise little insight. She appeared fatuous and stupid, where before operation she had appeared, between stupors, agitated, disgruntled, and stupid. Her relatives said that they had never seen her so well at any time in her life. Some doubt was privately felt, however, as to whether she would be as efficient as before in the discharge of household duties, though it was certainly felt that she had gained greatly in stability and in capacity for contentment.

Finally, a poor little illiterate widow of 61, who had all her life resembled Chucundra (the musk rat which crept always round the wainscot but never ventured into the middle of the room), fell into a state of agitated depression on having to cope with a heartless landlord who tried to dislodge her from her living accommodation. She was helpless without the support of her sons who were serving abroad, and about whom she continually worried, and she became chronically and panickily despairing over her future and what to do for the best. She was unable to keep still, continually wrung her hands, could scarcely speak for agitation, and was able neither to sleep nor to look after herself. There was a history of a depressive illness with suicide in a brother. A long fluctuating illness followed the patient's admission to hospital, with agitated crying and with morning-evening variation. At times she became well enough to go home, and did so twice, but at once relapsed away from the sheltered atmosphere of the hospital. After operation she lost her depression apart from occasional brief moments, and though still easily excited (on my visits she would jump for joy like a little child and would kiss me on both cheeks at arrival and departure), she was considered by her family to be more equable than for many years. Even a year after operation, however, she was far more indolent than she had been before her illness, was sometimes tartly outspoken, unreliable in execution of household duties, slatternly in dress and personal hygiene, and would occasionally defaecate in bed. This last was seemingly because a lifelong fear of getting out in the dark had now overcome her post-operatively reduced sense of social niceties. She showed a distinct gain in stability at the cost of lowered energy, efficiency, restraint, and discrimination. She was successfully weathering meanwhile a difficult domestic situation which a year before

mentis for such assessment, there were adverse post-operative personality changes in 3.

(7) Despite this, the total outcome is considered to have been beneficial in all 7 cases, if it is allowed that the onset of a schizophrenic psychosis more than a year after operation in 1 case was coincidental and not attributable.

as their mental defect would allow, were much improved. In 1 case the abnormalities of behaviour persisted in modified and less frequent form. In the other discharge home was possible, and the patient has had a remission longer than any previous one by more than a year.

(5) One case, with hemiparesis following a birth injury, who had been mildly psychotic for 10 years with an acute exacerbation forming a mixed picture of schizophrenia with depression following a love disappointment, became post-operatively stable, jolly, and fatuous, but, though no more obviously stupid than before, she was less efficient and reliable.

(6) One case, after an agitated depression, achieved a greater stability than for many years at cost of some reduction in energy, efficiency, restraint, and discrimination to an extent which rendered her unequal to the task of looking after herself, which she had been able to do before her illness. More than a year after operation, in a setting of genuine home difficulties, she relapsed into a mixed state of depression with manic features. She settled down in hospital to become a model patient but is still under care.

Summary

(1) The tiresome vocal activities of an idiot were reduced.

(2) Of 2 recurrently schizophrenic defectives, great improvement was obtained in 1 and marked improvement in the other.

(3) There was marked improvement, with freedom from distortions of content while still in hospital, in a defective who had shown mild schizophrenic features for 10 years and depressive features for 3 years. In another who had been chronically schizophrenic for 15 years there was marked improvement in conduct.

(4) A depressed defective, despite a relapse, showed on the whole an increased affective stability.

(5) There was an increase of stability in a hysterically psychopathic defective until a schizophrenic psychosis supervened.

(6) In the 5 out of the 7 patients who were sufficiently *compos*

he would never go out at all, but would sit with his head in his hands, moping and almost constantly complaining, so that he was absorbed with his complaint to the entire exclusion of anything else. 'Now,' said his wife, 6 months after operation, 'he goes out more than before he was ill, and enjoys it.' He was a regular attendant at football matches and the cinema, had taken his wife out on several occasions at his own suggestion, listened to the radio with interest, and had resumed gardening. He was liable to become a little irritable if it were suggested that he were better, and would warmly deny it. But his wife said, 'He's very *much* better. He never mentions his pain now, and nor do I. Before he talked of nothing else. He's much more cheerful, he even laughs now, and he hadn't done that for a long time.' Furthermore, he slept without sedatives or analgesics. 'I'd been prepared by the doctors,' said the wife, 'for considerable changes in his character, but I haven't found them.' In fact, though some were present, they were minimal. When seen 12 months after operation his hair had become markedly grey, with a white quiff over the middle of the forehead. He was still at the same job, at which, as inquiry by his wife had elicited, he was just as productive as any of his workmates. He pursued just the same routine of life. There were, however, a few small changes. Though his description of the pain was just the same as it had been, he now found, as pre-operatively, that the pain was liable to be fired off by drinking hot or cold fluids, which had not been the case at 6 months after operation, and was rather remarkable in view of the root section; and he found that it had again become liable to be precipitated by jumping. He would now agree, without a trace of irritability, that he could tolerate the pain far better than before operation, and when this was brought to his notice he accepted it as a remarkable phenomenon, but he had evidently never considered it before, nor was he interested in how his change of attitude might have come about. Although some post-operative frequency and urgency had improved, his energy had not returned to normal and he was still slightly less sympathetic and affectionate than had formerly been the case, but not to an extent which caused his wife distress. It was striking that when the writer made some remark to her that the patient did well despite his handicap, she said, 'What handicap? His pain? Oh, yes, he still has some pain, but I don't think he has any handicap at all.' Eighteen months after operation, as a result of something he had read in a paper, he wrote and asked about the worth of Sjorqvist's operation. Two years after leucotomy he was even more stoical and better adjusted.

CASES WITH DISORDERS ASSOCIATED WITH ORGANIC DISEASE

There were 7 remaining cases, all of whom showed marked disorders of behaviour, but in 5 of whom certainly, and in the other 2 probably, there was co-existent organic disease which helped to determine the symptoms to a greater or lesser extent.

One was a case of intractable pain, by difficulties in the diagnosis and treatment of which he had become demoralized; 1 suffered from sequelae of encephalitis lethargica; 1 was in the earlier phases of a pre-senile dementia; 1 had developed a schizophrenic psychosis of paranoid form in association with a severe head injury; 1 suffered from the effects of a birth injury to the head; and 2 cases are offered for diagnosis.

Case 298, a man of 40, with atypical trigeminal neuralgia, had found it impossible to get relief from pain. He went to a series of doctors who were at first inclined to take the matter lightly, then to consider the pain of psychic origin, until he reached high in the consultant scale, where the correct diagnosis was made. This was not achieved, however, until there had been implications of malingering, hysteria, and of depression, for which last the patient had obediently undergone a course of electroplexy, with, in fact, some slight but transient improvement in his morale. Numerous injections and a root section made no difference except for the development of corneal ulceration. Pre-frontal leucotomy was finally performed after he had had this pain for almost 18 months, through 17 months of which he had declared himself unable to work. He was a domesticated, steady man without any noteworthy neurotic features, who had shown an aggressiveness in the pursuit of a cure, rather surprising in an apparently colourless personality; this was presumably an index of the severity of his discomfort. He was in a state of irritated self-pity, but showed surprisingly little resentment against the profession. Post-operatively he had a brief period of rehabilitation, and resumed his work as a shoemaker within 3 weeks of returning home. He was disappointed at the result of the operation, and declared the pain to be exactly the same, and himself in no way improved. The fact was, however, that he tolerated the pain infinitely better. Pre-operatively he had got to the stage where

still obsessional, was more economical and direct. He had lost his symptoms of tension and his bizarre sensations. His mood was equable apart from transient moments of depression on reading or hearing something which reminded him of his past preoccupations, about which he was otherwise unconcerned. He no longer experienced his delusional compulsive thoughts, but laughed at the idea of his having ever entertained them.

The case with pre-senile dementia was of interest as showing [illegible]

view that pre-frontal leucotomy tends to accelerate the onset of senility.

Case 289, aged 62, had retired from the army after a distinguished career. He had been an ambitious and successful man, who had overcome many difficulties by diligence and perseverance. He had, to a noteworthy extent, always courted attention and had preferred to be the centre of interest, while his meticulousness had been sufficiently recognized for a *canard* to have been current for many years that he required his wife to indent in triplicate for the household stores. From the age of 55 onwards (his wife had noted) his lifelong enjoyment of limelight had been embarrassingly accentuated, and at social functions he tended to boast and 'show off.' There is evidence to suggest that he became increasingly meticulous in his work, but with steadily diminishing efficiency. At the age of 60 he began rather aimlessly to cut insignificant scraps out of newspapers with the avowed intention of making a book. He retired at this point, and began to devote himself obsessionally to gardening, without regard to time, after which he would repeatedly wash and dry his hands, saying that he could *not* get them clean. He then began continually to ruffle his clothes, saying that the trousers were not creased properly, and that his coats were not pressed properly. He would rearrange and refold these again and again, and he would rub at them until they were rubbed into holes. At the same time he complained constantly, but without foundation, that his bowels had ceased to function properly; this had been a minor concern of his for a very considerable time. His condition became markedly worse over a period of about 8 months, so that he would continue washing and re-washing and cleaning until 3 or 4 o'clock in the morning. Meanwhile, from being a sparing eater he had developed a voracious appetite. He showed some loss of control, not only over this, but

The symptoms of the post-encephalitic patient, a man of 45 who looked 60, were far more florid. He was a lifelong obsessional who had long been over-sensitive over his small physique, and over alopecia following an early attack of ringworm. After encephalitis lethargica in 1918 his obsessional traits became much increased, and he was subject to oscillations of mood which had become increasingly severe as the years went by. In 1927 he started to develop oculo-gyric crises, which had become more frequent and which he described picturesquely: 'My eyes search the heavens, and I can't bring them down.' He became increasingly irritable and bad-tempered, despondent, and lacking in confidence. From 1937 onwards, when he gave up his work as a schoolmaster, he was increasingly disturbed, and had been for long periods in general hospitals on 3 occasions and in mental hospitals on 6 occasions. He developed 'brainstorms,' accompanied by abdominal feelings of 'sinking and emptiness,' with low spirits, always associated with frequent oculo-gyric crises. At such times he developed delusions that his father had poisoned his mother, and that his father was in some way poisoning him; he would become tense and desperately concerned, and would seek police protection. Yet these were not ordinary delusions. They lifted as his mood lifted, he could be reasoned out of them, their onset could actually be foretold by observing his appearance and behaviour in the ward, and as soon as he got better he would withdraw what he had said. They were thus akin to compulsive thoughts. From 1945 onwards he had felt to be getting worse, with oculo-gyric crises associated with the delusional ideas, some bizarre somatic sensations that blood was running down his head, and a mood of despondency with restlessness and exacerbated obsessionalism, the whole lasting for 2–3 days, and recurring weekly, while between such phases he felt increasingly tense though still having a day or two, or a few days at a time, in which he felt normally well. Post-operatively the oculo-gyric crises were reduced from a bout on approximately every third day to a bout every 10 days, while on the same dosage of stramonium. His tremor of the lips and head were reduced somewhat except for when he had to keep the latter steadily in one position as when lighting a cigarette. The other signs were unaffected. He was much less spontaneous, and his talk, though

still obsessional, was more economical and direct. He had lost his symptoms of tension and his bizarre sensations. His mood was equable apart from transient moments of depression on reading or hearing something which reminded him of his past preoccupations, about which he was otherwise unconcerned. He no longer experienced his delusional compulsive thoughts, but laughed at the idea of his having ever entertained them.

The case with pre-senile dementia was of interest as showing relief from obsessional behaviour in its grossest and most paralysing form, shortly followed by a very rapid increase in the degree of dementia. It thus offers some support for the widely-held view that pre-frontal leucotomy tends to accelerate the onset of senility.

CASE 289, aged 62, had retired from the army after a distinguished career. He had been an ambitious and successful man, who had overcome many difficulties by diligence and perseverance. He had, to a noteworthy extent, always courted attention and had preferred to be the centre of interest, while his meticulousness had been sufficiently recognized for a *canard* to have been current for many years that he required his wife to indent in triplicate for the household stores. From the age of 55 onwards (his wife had noted) his lifelong enjoyment of limelight had been embarrassingly accentuated, and at social functions he tended to boast and 'show off.' There is evidence to suggest that he became increasingly meticulous in his work, but with steadily diminishing efficiency. At the age of 60 he began rather aimlessly to cut insignificant scraps out of newspapers with the avowed intention of making a book. He retired at this point, and began to devote himself obsessionally to gardening, without regard to time, after which he would repeatedly wash and dry his hands, saying that he could *not* get them clean. He then began continually to ruffle his clothes, saying that the trousers were not creased properly, and that his coats were not pressed properly. He would rearrange and refold these again and again, and he would rub at them until they were rubbed into holes. At the same time he complained constantly, but without foundation, that his bowels had ceased to function properly; this had been a minor concern of his for a very considerable time. His condition became markedly worse over a period of about 8 months, so that he would continue washing and re-washing and cleaning until 3 or 4 o'clock in the morning. Meanwhile, from being a sparing eater he had developed a voracious appetite. He showed some loss of control, not only over this, but

in throwing some toast and a napkin ring at his wife when she urged him to desist from his rituals. His clothes had by now become worn to shreds through continued picking and rubbing, and the skin of his hands and forearms (which he said he could never get clean) were grossly excoriated from the same cause. His notions of bowel-blocking increased, so that he also excoriated his anus and peri-anal flesh by repeated attempts to dislodge rectal faeces with a spoon. On admission to hospital he ate prodigiously, and licked not only the plates clean, but every square inch of the trays as well. He was transferred to another hospital, where his anal preoccupations increased, and he spent his whole time in pottering aimlessly, smoothing, folding, cleaning, wiping, picking, rubbing, in restless movement. He was admitted to a third hospital, where he was fatuously elated, continually scratching and wiping himself, with an extensive toilet ritual, so that he tended to spend hours on the lavatory seat, cleaning and scrubbing his perineum. He was admitted to a fourth hospital with an extensive dermatitis artefacta, and where he was diffuse and rambling but detailed, expressing numerous fears of dirt, mucus, and flies, and showing very poor memory for recent events, though accurate memory for events of more than 6 years before. He was miserably distressed. The least relaxation of vigilance was enough to allow the patient to find his way to the toilet, where he would start frantic scrubbing. In conversation he was self-important and confused, and while stressing his cleanliness would drop cigarette ash over himself, which he would rub into his skin, and would chew the cigarette end so that his mouth would be filled with small pieces of tobacco which he would spit out anywhere, while he would grub among butts in the ashtray and rearrange them on the top of the dressing-table. Physically he showed some marked arteriosclerosis, with a blood pressure of 155/100, but which was not considered adequate to account for his state. Operation was decided upon in the hope of allaying his obsessional restlessness which was otherwise quite uncontrollable. An advanced left-sided cortical atrophy was suggested by the finding at operation of a very deep left subarachnoid space, with some difficulty in finding cerebral tissue in which to make an incision. After operation it was soon possible to get him up and dressed, which, owing to his restless destructiveness and the impossibility of leaving him alone, could not be done before. He was dishevelled, with stained clothes, many detached buttons, and his pockets pregnant with bulky objects. He was fatuous and happy, indeed merry. He spoke in a firm, loud tone, in contrast to his pre-operative

mumbling. He much enjoyed telling stories, and, as a former expert conjuror, doing numerous tricks. He was garrulous and naïve, without a trace of obsessional preoccupation, and so engagingly friendly and good-humoured that what might have been boasting became merely a readiness to share with his friends the pleasure that he felt in his own talents. He had no insight, so that it did not occur to him that his retirement had been ruined, that his former worrying plans for augmenting his pension and savings to complete his children's education must come to nothing. He was entirely satisfied with a whist drive, a walk, and some card tricks. He had no complaints except that now his bowels were rather too free, on which subject he did not dwell, nor did he scratch himself. He remained in this state for about 8 months after operation, and was well enough to be discharged home. But he rapidly declined. A year after operation he was unrecognizable. He was pathetically lost and childish, disorientated and confused, able to give hardly any particulars of himself correctly, mumbling and perseverating, with no grasp whatever. There was some rigidity of the right arm and leg, and a very vigorous tremor of the right hand and forearm of Parkinsonian form, but exaggerated frequency. Now, 3 years after operation, he has deteriorated further, but remains alive. The only redeeming feature of this tragic case was that the malignity of nature was cheated in that this once distinguished patient was enabled to substitute 8 months of happiness for a state of intolerable worry, and rapidly passed thence into a mental chaos which seemed quite devoid of torment.

The next patient showed an insidious paranoid schizophrenic development after an apparent recovery from a severe head injury.

CASE 125 sustained a severe head injury with unconsciousness for 9 days at the age of 29. After a 2-year period of convalescence he was invalided from the army and returned to his former position in his father's business. He was in all respects thoroughly efficient at his work, according to outside observers, though he himself was dissatisfied with his performance and felt that his capabilities were reduced. There seems no doubt that he was capable of quite a high level of function. Only two odd things were noted: the patient, though invalided, kept saying he thought that he ought to join up again, whereas previously he had said that he ought to return to civilian life as his father was having so much difficulty with staff shortages: and he tended to dwell on the fact that the accident (in

no possible way his fault) was a reflection on his driving ability, of which he was proud. Eight or 9 months after return to work, nearly 3 years after the accident, and coincidently with a falling off of business, he became increasingly erratic, impulsive, and unpredictable; he was suspicious, violently touchy, aggressive, threatening, [illegible]

grudge. On admission to hospital he was by turns co-operative and pleasant, tense, asocial, and morose. He struck people occasionally and once escaped. He was evasive, felt himself victimized, and was exasperated by trifles. After nearly 2 years in hospital his tension appeared to be mounting and to be increasingly continuous, although he would admit to no cause, and no distortions of content could be elicited. Operation was decided upon as he appeared to be becoming worse. Post-operatively the tension was relieved, and the patient was amiable and pleasant. On return home after a few months this was not sustained. Though the patient returned to work, at which he was given a simple, specific task which none the less involved knowledge and which he did well though with painful slowness, his attitude at home was alarming. He appeared quite indifferent to his child, previously the apple of his eye, to his home, and to his future; he showed dislike and abuse of his wife, and though not actually violent, he would push and shove her about and warn her to leave him alone. He did not appear in the least deluded, but he did not appear quite safe, and was persuaded to return to hospital, where he seemed content to remain, and though occasionally resentful and withdrawn, would soon become amiable. It was evident that his referral to a mental hospital had been a sore point on which he was sensitive, and that he still had ideas of reference, but he was facile and self-contradictory without insight. He might have been [illegible] answers to [illegible] He settled [illegible] rged home, and returned to business, where he was amiable, pleasant, and polite, but hopelessly slack and erratic about time-keeping, while his work, though done with care and conscientiousness, was unreliable owing to difficulty in grasp. At home he was pleasanter, but at intervals so irritable as to be alarming at times. He was still inclined to be extravagant, had no insight into his being a liability rather than an asset to the firm, and would have spent beyond his income, had he been allowed, in attempts to speculate in second-hand cars as a

sideline, while he also bought a sailing boat which had to be returned. He appeared unable to see that he should not involve himself in expenditure beyond his means. He had, none the less, improved in that he was less vague and woolly, and in such respects as diminished suspiciousness and touchiness was very different, while he had shown considerable initiative and good sense in persuading a pensions board to raise his pension to a level from which they had reduced it, and in getting an educational allowance for his child. These favourable omens were further fulfilled, and at 3 years from operation he was much improved, free from distortions of content, ideas of reference, and abnormalities of behaviour. He was socially acceptable, more capable in his work, more regular in attendance, with better grasp. He had become a useful member of another firm, though in a more limited way than before his illness. Though his sensorial performance was still reduced, and he was liable to become muddled on large-scale operations, he must be considered to have recovered from his paranoid schizophrenia.

The fifth case was of interest in that he was relieved by operation of a symptom that is in mental hospitals occasionally, and in prisons often, found to be tiresome; namely, the persistent swallowing of indigestible objects.

Case 124, a youth of 20, had sustained a deformity of the skull in an instrumental birth. He showed an irregular bony protuberance on the right side of an asymmetrical skull; there was an infra-nuclear facial weakness, with some inco-ordination in all four extremities, more marked in the arms, and grossly-exaggerated knee and ankle jerks with pseudo-clonus on both sides. He was childish in manner, distractible, and over-anxious to gain attention. He looked mentally defective, but was not. He was always insecure and dependent; at school he was solitary, a year behind the others, and unable to take his own part; he was unduly excitable, and his emotions readily got out of control. At 18 he tended to get 'attacks' of excitement, in a setting of frustration over his work, and he would show rages with threats of violence towards his mother. These usually happened in the mornings, when he would be so restlessly angry that people were frightened both to be with him and to leave him on his own. At the end of these episodes he would feel exhausted and would tend to deny any memory of what had happened. In hospital he was restless, difficult, and interfering, often gave in his notice, but would withdraw it, and several times tried to run away. At 20 he was certified, having been violent and threaten-

ing when allowed home, and in hospital was angry, resentful, noisy, quarrelsome, and abusive, between importunate efforts at currying favour. Small items would provoke him—such as if he were kept in by rain or if someone failed to give the answer he wanted—into angry and agitated rages, in which he would strike out, tear up strong blankets, and drag out and eat the stuffing of hair mattresses. At other times he would sit with head in hands in moods of deep depression. He repeatedly swallowed foreign bodies, though these were usually small ones: shoelaces, clips of various sorts, pieces of cloth, coins, buttons, nibs. He was deterred from larger objects after a fountain-pen had stuck in his throat, but soon after swallowed another patient's spectacles. He stated that he did this in order to 'put himself out of his misery' as he felt at such times that all were against him. It was felt that there was a measure of truth in this explanation, though more often the swallowing was believed to be a device for gaining attention. Post-operatively, relieved of his affective excesses, he was far more adult, less anxious to impress and please, and met people on level terms. Physically the briskness of his tendon jerks was much diminished, and the patellar and ankle (pseudo-) clonus had disappeared, while the co-ordination became within normal limits. He still tended to have spells of irritability, and these would last 3–4 days, but were unaccompanied by any real depression. They always occurred in reaction to small frustrations, and sometimes were still extreme. Ten months after operation he broke some chairs, and more than a year after operation he ripped off his clothes and dashed about naked. For by far the greater part of the time, however, he was equable and well behaved. He swallowed no indigestible objects except, as he said, the hospital fish, from the time of operation onwards.

The following two cases are offered for diagnosis. The first is considered to have been a manic-depressive patient with insidious senile changes.

Case 300, a bald, pyknic, florid man of 65, with distinguished features and a grand manner, the son of a clergyman, brother of another, and the grandson of a prelate, had led a very restricted life following his adoption by a paternal aunt at the age of 4. He was a frail and dependent child, and at the age of 8 it was advised that he should lead an outdoor life while being privately educated with a tutor. At 16 there was much conflict over masturbation and over whether or not he should take holy orders, against which he was advised. *At 21 he had a frank depressive illness with recovery, after*

which he returned to lead a rural life with his aunt, where he did a little farm work in a dilettante way, mingled with journalistic jottings for the local paper and the parish magazine. He seems never to have known anyone well, though superficially friendly, but he derived much satisfaction from a certain social position as well as from being regarded, in an extremely minor way, as a man of letters if of eccentric sort. When the patient was 50 his aunt died and he inherited the property, but he became markedly depressed with suicidal thoughts and somewhat bizarre notions that razors were slashing at his throat. He recovered after a period in a nursing home, lived rather eccentrically for a while in a Y.M.C.A. in London, where he visited museums and churches, and at 52 returned to his property in the country. He then became preoccupied with ideas of taking holy orders again, and when dissuaded, made a nuisance of himself with the local bishop through his efforts to become accepted as a lay preacher. Meantime he led a somewhat eighteenth-century life, with much reading, some amateur and dilettante study of various subjects with note-taking and vague notions of writing treatises, and maintenance of a voluminous and unnecessary correspondence. At 58 he again became depressed, with suicidal preoccupation, and fears that he might murder the local rector. He was admitted to hospital in an agitated and guilty state, blaming himself for having been deterred from marriage by snobbish considerations, and much preoccupied with sexual conflicts. He seems to have had 3 manic phases in the following year, punctuated by much reading and the writing of naïve but coherent articles on such subjects as prison reform and the history of the Bank of England. At 59 he began to masturbate with great frequency, and to feel a desire to expose himself in public. It may be noted that for some years he had been obsessed with an anxiety lest he might not be decently dressed, and was accustomed to walk about carrying a book for no other reason than to dispose it suitably before him on meeting people. He was allowed parole and used to seek village churches in which, having first gained permission from the surprised incumbents, he would ascend to the pulpit and deliver harangues to the empty pews. Over the ensuing years he became an increasing public nuisance through insisting on walking in the middle of the road, reading aloud in a stentorian voice in the streets, and through button-holing strangers who found it difficult to detach themselves from his voluble conversation. He took to defaecating and micturating indiscriminately wherever he happened to be. He was increasingly grandiose even when not hypomanic, saying that he

had read the encyclopaedia 96 times and had many messages to impart to the world. He started to scribble all day, dictating grandiloquent phrases to himself as he wrote, but the written material consisted only of a simple repetitive scrawl. He delivered loud sermons in the wards and gardens till the other patients became exasperated, but he was always polite and pleasant. When not sermonizing he spoke exclusively about sex, on which he always had something to say, and the subject matter would contrast strikingly with the urbane manner in which he would introduce it with the words, 'Now, my dear archdeacon. . . .' He would talk on and on, glibly and pompously, coherently but not consequentially: 'For 30 years I thought I was born a constitutional eunuch; you see, my tutor had been in Manchester, London, and Brighton, and was familiar with all sorts of horrors as a clergyman, and in a moderate way, mind you, in a moderate way, I'm a distinguished man.' There was accompanying this garrulity no other over-activity, and there were interpolated into it disconnected items: 'Poor Matty Hornchurch, I'm sorry to say, did a very foolish thing; he married some third-class nurse and they had a lot of children, including twins.' Withal this, he could give perfectly good answers to questions when pressed, could retain 8 digits forwards, remember a name, address, and flower for 5 minutes, did monetary calculations quickly and accurately, made no mistakes on serial subtraction of 7 from 100, but could retain only 3 digits backwards. Physically there were no abnormal findings and the blood pressure was 160/90. His combination of garrulous discursiveness with apparently good intellectual preservation, push of talk with, if anything, under-activity, perseverative scribbling and deteriorated habits, presented an odd mixture. He was operated on chiefly on account of his noisy sermons, which rendered the lives of his associates quite intolerable. In this, and in some other respects, the operation was successful. He rarely tried to deliver harangues, and if he did, would readily stop when asked. He would attend occupational therapy and, though he could not work well, he applied himself. His conversation, thematically the same, was much reduced in amount. On the other hand, he showed more of other activity. He scribbled, the same repetitive scrawl as before, on anything of which he could get hold, and he wrote hundreds of indecipherable letters amongst which, however, were some that were fully intelligible, including one to a bishop investigating the possibilities of being ordained, to which he received a formal answer. He expressed a desire for more exercise, went for long walks, and returned punctually without

being a public nuisance. On the other hand, owing to slight frequency with urgency, he wet himself often, and he became obsessed with the idea that he was constipated, so that he would excavate his rectum with his hands, and would plaster faeces about indiscriminately, apologizing suavely when taken to task. It was surprising that 12 months after operation he had controlled his incontinence and had been persuaded to defaecate normally. His spontaneity had somewhat returned, and when out on parole he was liable again to talk to strangers, to make inquiries about getting lodgings, and to order suits and other unauthorized things. Two years after operation his failing intellect was more noticeable in that he repeatedly forgot where he put things, was slower, showed obvious difficulty in grasp, with diminished span of memory on testing. He was still, however, able to enjoy parole (which made an enormous difference to his life), and would always return on time. He had numerous plans for nipping up to London to get married, which he showed no intention of implementing, and though loquacious and discursive he was no longer noisy nor a trouble in public, while his habits have undergone no further deterioration.

The following case is not understood at all, but the symptoms and general behaviour seemed to have an organic flavour.

A 47-year-old Irishman had done practically no work for 20 years, but had lived with his wife and 4 children on charity. At 44, when temporarily in work, he seemed to lose interest. 'He was fed up,' his wife said, 'he didn't have any interest, I think that's why he gave up his work. He stopped home one morning and they didn't bother about him and so he just stayed longer. He'd never go out or anything, he'd just stand in front of the clock. He'd talk to himself at night in the bedroom, he'd shout out "Mother" and seem distressed and he wouldn't tell me why. Yes, I had the impression he was right down-hearted, miserable. His habits would get very dirty. I used to find wet in the grate, and I'd find he'd been dirty up in the bedroom . . . and he'd write with his fingers on the mirror, he'd wet 'em and write on it.' The patient was finally coerced into hospital by a welfare worker. In hospital he complained of strange pains in the back for which no cause could be found. He was dishevelled, picked and tore at his clothing till it was destroyed, continually picked the skin of his cheek, avoided washing, would start to micturate as soon as he entered the lavatory door and would finish before arriving at the urinal, would spit anywhere, defaecated on the floor, inserted his fingers into his rectum and would smear

faeces on the wall; he smeared his moistened fingers along the mirror whenever he passed it, even though it had just been cleaned; he would walk behind other patients and then slyly tip them over, if sufficiently frail, with a jerk of the shoulder. When taxed with any of these actions, he invariably denied them. He appeared mildly depressed at times but not grossly so, and he was never agitated. He seldom spoke, except sometimes to complain falsely that he could not eat, to make wildly untruthful and sometimes fantastic accusations about the staff and other patients, and to shout noisily at nights, apparently in response to voices. This last, coupled with a tendency to laugh suddenly to himself, led to the supposition that he was hallucinated. He himself denied this, as he did everything put to him, and was aloof and asocial. At interview he talked readily about his pains in the back, but was guarded on all other topics. He gave some account of himself, economically worded and strictly edited. He was orientated to within 3 days. He did not appear depressed. No evidence could be gained from what he said of delusions, hallucinations or ideas of reference, but he was secretive and disgruntled. He was disinterested in life both in and outside the hospital and hardly in touch with current events. He could retain 6 digits forwards and 4 backwards, got 3 out of 3 simple sums wrong, made 3 mistakes in serial subtraction of 7 from 100, but grasped the cowboy story without difficulty. There were no physical signs beyond old arthritis of the right elbow, and a blood pressure of 170/115 Wassermann reaction was negative. He had made no response whatever to electroplexy. Three years after onset of the symptoms and after 2 years in hospital he was operated on. After operation he was far more accessible, lost his hostility, talked spontaneously, denied any symptoms and ceased to complain of pains and of being unable to eat. He became clean in habits, washed and kept himself well, used the toilet in the ordinary way, never spat or fingered the mirror, stopped laughing to himself, and ceased to shout at night. He still lacked spontaneity, but his behaviour was not otherwise abnormal in any way, while he had stopped his lying and accusations. He was discharged on trial and his wife then applied to keep him. She somewhat regretted this later. The patient would get up early in the morning, do the fires and clean the shoes, as well as other chores which he had never done before. He kept himself cleaner than had ever been his wont. He showed more interest than he had ever shown, went to football matches and the cinema, and would give animated and correct accounts of what he had seen. There were several things to be said, however, on the debit side.

About every 3 weeks he would have a phase of irritability which would last for 7–8 days, during which he would be quite unrestrained in language and sometimes violent, kicking the fender and

home, and showed an odd determination not to go to the labour exchange. He got more than one job for himself, but when the necessity arose, as he knew it must, for visiting the labour exchange for the completion of formalities, he would refuse to go. On one occasion I took him there myself and saw him in; but I learned later without surprise that he had left by another door forthwith. Another peculiarity was that he showed a new tendency to speak in very frank and stereotyped fashion about sex; he did not do this in the home, but just as formerly he had licked his fingers and smeared the mirror whenever he went past it, now he could not pass a young girl in the street without making a coarse remark, almost always just the same one, to whomever he happened to be with. A year after the operation his bouts of ill temper suddenly ceased (there had been no apparent environmental cause either for their onset or their cessation) and he became quite pleasant to live with. 'Everything is lovely now,' said his wife. Soon after that he got work as a Christmas postman, and later he actually went to the labour exchange and had 2 jobs as an electrician; neither lasted more than about 2 days, apparently because he was quite inefficient, and, indeed, although it was work which he had once done, he had not tried it for 17 years. When he was last seen, at 18 months after operation, he had been working for 2 weeks quite satisfactorily as a boiler-cleaner, and, most unusually for him, had expressed a *positive liking both for the job* and for his workmates. It may be added that his sensorial powers were exactly the same as before operation, except that he could reverse only 3 digits instead of 4.

SUMMARY

Thus of 7 cases whose states were associated with organic illness of various kinds:

(1) There was substantial improvement in a man with intractable pain, and

(2) In another with post-encephalitic sequelae.

(3) There was *recession* of a paranoid schizophrenic state which had developed following a head injury, but there were

marked residual defects which may have been partially attributable to the three factors of organic damage following the injury, damage following the operation, and to some residuum of the schizophrenia.

(4) There was some improvement of behaviour in a poorly-controlled youth with an intracranial birth injury, with cessation of his habit of swallowing objects indiscriminately.

(5) There was marked temporary improvement in the obsessive-compulsive symptoms of a pre-senile dement of obsessional personality, with subsequent rapid increase in the dementia.

(6) There was some reduction in the floridity of behaviour of a patient presumed to be a manic-depressive with early senile deterioration.

(7) There was ultimate improvement in another man, whose illness was neither diagnosed nor understood, but in whom the period of observation was not long enough for assurance that the improvement was maintained.

'PARTURIENT MONTES . . .'

In surveying the results of this investigation as a whole, the conclusions that emerge, though not without their interest, are all too few.

There can be no doubt that pre-frontal leucotomy, like most other surgical operations, is capable both of conferring benefit and of doing harm. The difficulty in assessing its worth, as with other procedures that are not fully understood, lies in striking a balance between a reactionary rejection on the one hand, and a missionary zeal on the other.

In this series there has certainly been a number of deaths, and the rate of post-operative epilepsy has been much higher than has hitherto been popularly supposed, while a few of the patients have been worse. Yet it is difficult to think that anyone who has read the results here presented could feel otherwise than that the operation has been abundantly justified. That is not to say that it will continue to be used in its present form, nor that surgery will necessarily become indispensable. But it amounts to saying that there is beyond doubt an established case for the surgical treatment of psychiatric disorders.

This is felt to be so to an extent which entitles one to dismiss the many objections to such developments that have been raised in the past. It was natural that there should have been such objections, and where they were founded on good sense, they were proper. But we have arrived at a time when, with the accumulation of knowledge and experience, we need no longer attend with much seriousness to such objections as were raised, for example, on grounds of principle but seemingly without experience, by Winnicott in 1943, and revived by him in 1946. Yet it is also true that the anatomical reduction by which the procedure appears to exert its effects involves also a reduction of the patient to something less than what he was.

From this there follows a cardinal principle that this operation must be the treatment of last choice, provided that such choice is not delayed beyond the limits after which recovery becomes impossible. It looks as though there are such limits in the schizo-

phrenic and affective disorders. The figures given suggest that in schizophrenic illnesses of an established sort the chances of recovery are diminished after more than 5 years from the onset, while, taking the depressive states all in all, the chances of recovery are diminished after a shorter time (probably about 3 years from the onset), except in such conditions where fluctuations in the illness, whether spontaneous or therapeutically induced, are still occurring or where external factors or psychic conflicts seem to have played a major part both in its development and in its prolongation. It would appear also that in the obsessional states the chances of recovery by operation are reduced once the development of rituals has become established and entrenched, and especially where they are accepted by the patient so that they are carried out more rather than less automatically, and with less in the way of protest as shown by nervous tension. Much the same was seen in the post-operative persistence of delusions, once they had become constant and firmly fixed. The decision whether or not to operate must therefore depend on observation with a view to determining whether the illness is developing, despite other treatments, a fixed and constant form; the more that the content and behaviour tend to assume an established abnormality of constant pattern, and the less that there are variations and fluctuations in that form, the worse is the prognosis for treatment by operation—or by any other means. In such an event, provided that other appropriate treatments have failed, and that there is a high degree of incapacity, there would seem no sense in waiting until some theoretical time limit is reached; on the other hand, it would seem sensible to embark on operative treatment, which at least offers reasonable hope of recovery, without too much hesitation. Some hesitation must naturally be felt, however, in special cases, most important among which are those where it is desirable to preserve in their entirety some special intellectual endowments which may be either essential to the patient's livelihood or of high potential value to the community: and also where the patient's pre-morbid personality has been such that there is risk of his being rendered an intolerable person after operation. The decision in such cases may present very great difficulties indeed. But in a case of established schizophrenia approaching its fifth year of illness, despite deep insulin treatment,

provided that there were still some affect and capacity for emotional response, there would be so little to lose and so much to gain by operative treatment, that the writer would feel no hesitation at all; in many instances he would feel no hesitation after much shorter periods of time. And the more that the illness involved reaction to the symptoms in the form of perplexity and conflict, the more optimistic would he feel about the outcome. We have already seen, in our schizophrenic patients, that the further the illness was removed from essential and established schizophrenia, the more that it was affectively coloured and the more that it was marked by active psycho-dynamics contributory to its development and prolongation, the better were the results.

Likewise, an ominously ingravescent obsessional illness with increasing development of rituals and paralysing effect upon the patient's capacity, but without marked affective disturbance and unchecked by reasonable attempts at removal of both external and internal sources of stress, would constitute for the writer an indication for operative treatment before the rituals had become automatic and entrenched and therefore irremovable. Where, on the other hand, there is accompanying affective disturbance, every effort should first be made to relieve that by other means, in the hope that the obsessive components may be rendered more controllable without resort to operation. Where the manifestations are confined to the recurrence of compulsive thoughts or of distressing and persistent ruminations, the relief by operation was, in this series of cases, more complete than where there were rituals as well. The decision whether or not to operate, though it may be accompanied by greater optimism in such cases, must depend on the amount of distress caused and the patient's reaction to it, in terms of incapacity and possible suicidal risk, as well as in relation to the degree of success attainable by other forms of treatment, which can be given the more extended trial since there seems to be no correlation, in such cases, between the duration of the symptoms and the degree of recovery which can be achieved by operation.

In affective disorders the better prognoses which they carry may give rise to greater difficulties in deciding the operative indications. The operation exerts its greatest effect, as we have seen, on those conditions which are marked by load (in the form

of agitation, distress, and emotional excesses), rather than on those marked by loss (in the form of emptiness, restriction, and apathy). Where a depressive illness is running, with unremitting course and with absence of marked fluctuation, with failure to respond to other forms of treatment, towards the end of its third year, it is justifiable—in the writer's opinion—seriously to consider treatment by operation, so long as there is some affective response, if only to stimuli which give rise to psychic pain. If there is serious suicidal risk, with difficulty in nursing, and where there are other special considerations, it may be equally justifiable to decide at an earlier date. If the illness has lasted in unremitting form for longer than 3 years, treatment by operation would appear no less justifiable, but the prognosis for full and rapid recovery should be more guarded the more the illness appears to be autonomous and constitutionally determined, and the less that its development and prolongation appear explicable in terms of active and continuing psycho-dynamics. In such cases there is a tendency for the underlying depression to be persistent despite removal of the more florid symptoms of agitation and distress; there is, further, the possibility that hypomanic features may be released. Indeed, the occurrence of manic or hypomanic features at any time in the patient's pre-operative life would seem, while no contra-indication to operation so long as other treatments have failed first, an indication to give an especially guarded prognosis in view of their tendency to appear either immediately after operation or later, though often, as has been described, in much attenuated form. With cases of rapidly recurrent illness, the decision whether or not to operate must depend on the extent to which the patient's life is dislocated and on the general difficulties caused by such rapid recurrences, as well as on the length of time over which they have occurred; but tendencies to deterioration, to the attainment only of remissions of less good quality, and to the development of mixed psychotic features will weigh in favour of operation.

In other cases the decision will have to be made by bearing in mind that this is a symptomatic treatment which can confer benefit where the psychic life has developed a turbulence which has got beyond control, and which achieves its effects by reducing the complexity of that psychic life. The post-operative person-

ality will be a modified version of the previous one, and the chief modification will lie in a reduction of the affective load; where, therefore, there have been unpleasant or undesirable personal characteristics which have arisen as a result and as a part of that affective load, such characteristics will tend to be post-operatively reduced. But where they have arisen not so much from morbidity or affective loading, as from other intrinsic tendencies in the patient's personality, they are likely to be increased, since the post-operative personality tends to be more primitive and less controlled. Such traits may then prove a strong contra-indication to operative treatment in the doubtful case. The existence of homosexual propensities kept in check by neurotic anxiety may, for example, cause post-operative trouble through lack of control, as may pathological aggression if, without being evoked by special frustrations or neurotic mechanisms, such is an essential feature of the pre-morbid personality.

It is this reduction of the psychic life to a simpler level that makes us hesitate before recommending operation. Post-operatively the responsiveness of the patient is reduced, and in so far as spontaneity, so-called, is a measure of responsiveness to stimuli, so is that also reduced. There is less activity and more inertia. There is a blunting of affect, due to a reduced complexity and intensity of feeling, and therefore there is less variation and more equability of temperament. The intellectual processes are simpler, with attention to the immediate rather than to the remote, to the factual rather than to the theoretical, with decisions that are simple rather than deliberative, and with a restriction of the intellectual range. The total pattern of reaction is simpler, marked by an essential tendency towards avoiding discomfort and courting pleasure, with lowered standards of criticism, reduced self-awareness, and diminished self-control, which last is considerably offset by the lessening of responsiveness in general.

Yet, though we hesitate to impose this reduction upon the patient, it is one which is often recommended by physicians, and wisely, for it amounts to little more than the oft-given advice to take more relaxation, to make fewer demands upon and to live essentially within the limitations of the self. The difference is that post-operatively the patient has no option, nor the same potentialities.

But the post-operative state should never be judged except in the light of the pre-operative condition and the prognosis which that carried. If this summary of the post-operative personality seems gloomy, it must be remembered that all the patients in this series were severely ill, that many (if not most) were hopeless chronic invalids and many were very poor material. Ström-Olsen and Tow (1949), in drawing attention to the post-operative deficits, have observed that it is those patients with the best personalities and with the highest talents who in fact lose most by operation. In a quantitative sense this no doubt is true, but they are also the patients who achieve the most successful functional results. And after all, the post-operative state is compatible, to the writer's knowledge, with resumption of work as a university professor (whose conversation, it may be noted, is fully ideational and far from stereotyped, and whose state has been such for many years as to defy the detection of any essential abnormality), while in this series instances have been shown of resumption of work by people who were totally incapacitated, as a doctor, trained nurse, secretary, printer, teleprinter, telephone-operator, electrician, etc. This is not to say that these people were all that they had been before, but it is to say that it was possible to bring them by operation from a state of total incapacity to a useful level of function. This is a fact, and when the inadequacy of alternative treatments is taken into account, it should sufficiently dispose of such statements as that with which Cobb (1943) mars his fascinating book by saying: 'Specifically, I can only recommend the operation in cases of prolonged agitated depression over 60 years of age, or in rare instances in younger patients who show mental deterioration and neurological and electro-encephalographic evidence of cerebral degeneration.' This is frankly preposterous, and when one makes allowance for its having been written as long ago as 1943, one is none the less astonished that it has been allowed to appear in subsequent reprintings.

It is hoped that enough has been said to show that pre-frontal leucotomy is not to be lightly undertaken, but that its consequences are not so grave as to justify long delay in the suitable case, when the prognosis is known to be bad and when other treatments have failed.

Speculations

There are other things to be considered. When one sees a patient who has been insidiously ill for 8 years, and severely so for between 3 and 4 years, with an increasing deterioration which culminates in the eating of faeces while in the padded cell, and sees him just over a year after operation, physically robust, and singing excellently in a well-known choir which is participating in a choral competition, having taken the bus from his home to get there: when one sees a patient with contractures of the semi-tendinosus and semi-membranosus from having spent the better part of 7 years in fixed attitudes of prayer between bouts of being violent with double incontinence, and sees him within a year of operation making 50 at cricket, having taken the afternoon off work to play for a local side, one feels bound to make some inquiry as to how it is done.

No one knows the answer. Freeman and Watts have supplied a part of it, by showing something more than Moniz's original idea that it might be possible to abolish fixed delusions by disorganizing the neuronic arrangements that subserved their formation. For they have shown that section of the thalamo-frontal radiation is of importance in securing the result, and further, that that is followed by degeneration of the dorsal medial nucleus of the thalamus. They are almost certainly on the threshold of something further, when they relate the post-operative 'bleaching of the affect' with that nuclear degeneration. These may well be related, and so perhaps may be the post-operative reduction in activity.

But Freeman and Watts carried their speculations much further than that, and when they go so far as to say that the dorsal medial nucleus of the thalamus is the physical substrate of emotion, they have exceeded anything that is warranted by the facts. When, further, they seek to explain the so-called 'functional psychoses' (which look increasingly to be organic psychoses) as being the products of worry, and for that reason relieved by the reduced capacity to worry that follows operation, we can be sure that this is but a very partial explanation. When, going further than that, they say that without the frontal lobes 'there would be no functional psychoses,' they are making a statement that is not

only without evidence in its support, but is devoid of any reasonable expectation of fulfilment.

While it is true that there has been no case recorded in the literature of the initial occurrence of the so-called functional psychoses after lobectomy or leucotomy (for Banay and Davidoff's case (1942), later found to have become psychotic by Friedlander and Banay (1948), suffered from a psychosis of known organic origin) there have been plenty of relapses, and the cases among the material presented here in which a major paranoid state developed for the first time after operation (CASE 22, page 152), and in which a psychopathic girl of 16 without pre-operative evidence of psychosis developed a full-blown schizophrenic state within a year of operation (CASE 293, page 417), form weighty evidence, though not conclusive, against such a dangerous deduction.

Yet one feels grateful to Freeman and Watts even for these extravagances, for they bear the same stamp of that intellectual enterprise and impatience of the humdrum that enabled them, against misgiving and bitterness and hostility, to place Moniz's original experiments on a new and established basis, to extract order from confusion, and to provide at least a partial theory to account for the results. When one reflects that the enormous work involved (including the production of the standard book on the subject, a score of articles, and the neuropathological investigations) was done by themselves alone, and carried out entirely within a busy private practice, one forgives extravagant remarks as well as doubtful diagnoses.

That the degeneration in the dorsal medial nucleus which follows section of the thalamo-frontal radiation is related to the post-operative reduction in the complexity of the psychic life, remains the only conclusion of which at present we can feel assured.

There are other points, however, which are suggestive. We know that the effect of operation is to isolate, to a greater or less extent, the pre-frontal cortex on one side of the incision from the thalamus and the hypothalamus on the other. It is also known that the anatomical findings are such as to suggest that the pre-frontal cortex and the anterior cingular cortex, at the upper level, are involved with the thalamus and the hypothalamus, at the

lower level, in an intimately connected and co-ordinated system. If for the moment we disregard the anterior cingular cortex (which is relatively seldom disturbed by the incisions in pre-frontal leucotomy), it would appear that the main effect of the operation is probably achieved by preventing, or by reducing, the passage of stimuli from one part of this co-ordinated system to the other parts. Further, though the work of Meyer and his collaborators has shown that there is a not inconsiderable fronto-thalamic connection and that there are even some direct connections between the pre-frontal cortex and the hypothalamus itself, the bulk of the fibres cut by the operative incision are thalamo-frontal, running from the dorsal medial nucleus of the thalamus to the pre-frontal cortex. A large part of the *modus operandi* of pre-frontal leucotomy might, therefore, be understood if we knew the nature of the stimuli which pass in the intact brain from the thalamus (and from the hypothalamus via the thalamus) to the pre-frontal cortex. It is unlikely that we shall know this until we have fuller understanding of the functions of these component parts. Yet we know something of the functions of some of them.

We know, for instance, that the hypothalamus plays a crucial part in effecting the bodily responses with which we react to changes in the environment. The pulse and respiration rate, the blood pressure, the tone of hollow viscera, the temperature, the degree of hydration and dehydration, and the general level of wakefulness and responsiveness of the person, are all dependent on hypothalamic influences. In so far as these vary with and reflect the emotional state, it may be said that the hypothalamus influences the tensions at which we live and controls the physical accompaniments of the emotions which we feel; indeed, it would seem to provide by its influences the *milieu* within which conscious experience becomes possible.

As to how conscious experience becomes possible, it is remarkable that we seem to know nothing at all. But as to where it becomes possible, clinical neurology and physiological experiment have afforded at least the glimmer of an idea. The thalamus, as the great reception centre for afferent stimuli from the special sense organs and from the rest of the body, would seem to be a nodal point. It seems to have the function of integrating these

afferent stimuli into percepts, and of endowing them with some sort of emotional investment, through which they enter consciousness and become subjective experience. That there is some sort of thalamic awareness, however primitive, is suggested by the fact that a decorticate cat can show rage at a barking dog (Miller, 1941).

It would seem probable, therefore, that we can consider the thalamus and hypothalamus together in that the latter may provide the *milieu* which enables these percepts and sensations mediated by the thalamus to become conscious emotional experience.

If we suppose that it is by that combined activity that the conscious experience of emotion becomes possible, it is natural further to assume that the pre-frontal cortex, which appears from the anatomical arrangements to be the main receptor area for hypothalamic stimuli, may be concerned with enabling the agitating or enlivening effects of hypothalamic activity to find their fuller and richer expression in the emotional life. This still begs the question as to the nature of the stimuli that pass. If we assume that they are stimuli which give rise to the experience of emotion, the further question is raised as to whether emotion can exist *per se* as a floating entity without attachment to any percept, concept, or idea. It is difficult to conceive of this, but it certainly seems from clinical psychiatry that there are many states in which the mood is primary, and is the determinant rather than the result of the mental content. It seems that it was the non-recognition of this that led to surprise when Moniz found, in some of his early cases, that the depressive delusions persisted despite destruction of those fibres which he believed to be responsible for mediating the delusional experience. But there would be less cause for surprise if the delusion were determined by the mood, and the source of the mood disturbance itself were left untouched by operation. The state of affairs could be explained if we were to suppose that the source of the mood disturbance lay in the hypothalamus and thalamus, for then interruption of the hypothalamus-thalamus-pre-frontal-cortex system at levels above the thalamus could be expected to result only in a reduction in the fullness of the emotional experience. Indeed, that is exactly what happened. The depression persisted,

and so did the delusions, but the agitation and distress that arose from them were substantially reduced. The same result was later noted by Mixter, Tillotson, and Wies (1941), and there have been various instances in the case-material presented here. Such a supposition would also help to explain the persistence of depression despite the immediate removal, by operation, of its more florid manifestations, in those cases which later progressed very slowly towards recovery. They had the appearance of their illnesses being prolonged by the *emotional* repercussions with which they reacted to the basic illness itself, and which were perhaps elaborated by the thalamo-cortical system; and it seemed as though, shorn of those emotional repercussions by operative destruction of the thalamo-frontal fibres, they were then enabled spontaneously but slowly to recover. If this was so, it is reminiscent of Cid's original contention (1937) that part of the *modus operandi* of leucotomy lay in 'putting the injured part at rest.' For it would also seem that, by virtue of the to-and-fro connections, the pre-frontal cortex, thalamus, and hypothalamus work in mutually co-ordinated fashion with reciprocal influences on each other.

Much the same sort of thing was seen in other cases in our present series, who were not depressed in any true sense of the word, but who had been accustomed for years to live in an egocentric and emotional vortex, through repeatedly whipping up and wallowing in their emotions. Post-operatively they were transformed into sensible and phlegmatic people who led their lives with ordered calm. Was this not because the post-operative reduction of the thalamo-frontal pathways rendered impossible that elaboration of their feelings which they had pre-operatively shown?

If we suppose that the thalamo-frontal radiation and the pre-frontal cortex are together responsible for the enrichment and elaboration of the basic emotional life, and we look for evidence of a possible source of mood disturbance below that level, there is no difficulty in finding it. Mania, for instance, though it has never been observed in association with lesions of the hemispheres, has been recorded in association with known lesions of the hypothalamus (as has depression), and has even been found producible to order during surgical procedures (Fulton and

Bailey (1929), Guttmann and Hermann (1932), Foerster and Gagel (1933), Bumke and Foerster (1936), Alpers (1937), Cox (1937)). It would seem reasonable, therefore, to suppose that it is at levels below the thalamus that the sources of primary mood disturbance are to be located, and that it is at levels above the *thalamus that these disturbances are increased by elaboration.* Such a concept would help to explain the results that we have noted in our own cases, where post-operatively the mania persisted, though in modified form, and where the recurrences of hypomania were post-operatively so much less elaborate and fully developed as sometimes almost to escape recognition. It would seem in such cases that the basic liability to affective disturbance had by no means been removed by operation; but that the spread of excitation had been reduced by reduction of the number of available pathways from the thalamus to the frontal lobes. It appears, in fact, that these patients had been operated on above the level of the lesion.

This hypothesis (and it is not put forward as more than that) has been elaborated by the writer elsewhere (Partridge, 1949).

The assumption that the thalamo-frontal radiation and the pre-frontal cortex are together responsible for the richness and intensity of the emotional life, would also lead one to suppose, since positive emotions tend to prompt the person to activity, that they are in part at least responsible for the animation of the person. There is certainly clinical evidence in support of such a supposition, and it might be that that reduction in emotional intensity and animation which follows operation is the basis of the improvement that we have noted in obsessive-compulsive states, where, though post-operatively the thoughts tend still to recur, the prompting to activity is far less intense. One is bound to wonder also, in this connection, how far there might be room for application of von Economo's deduction from cyto-architectonic and comparative anatomical studies (1935) that the anterior parts of the frontal lobes are concerned with the motor manifestations of personality: 'The simplest motility occupies the pre-central gyrus, but it progressively increases in complexity and in psychic components in approaching the pole.' Bucy (1935), in connection with motility, has stressed that increased dexterity is the most striking achievement of the ape as compared with lower verte-

brate forms, that this is associated with a 'tremendous' development of area 6, and that the great development of the frontal areas in apes and man (which must imply some comparable increase in function) is probably connected with the utilization of that dexterity. Woodworth (1935) has put forward a not dissimilar view that the frontal lobes may be concerned with the organization into action of motor behaviour guided by mentation. Might there be in such a concept some explanation of the post-operative continuance of rituals, which we have repeatedly noted, through some almost automatically recurrent chain of events established posteriorly to the operative incision, and therefore continuing despite the reduced emotional intensity of the obsessive-compulsive state?

These are wild speculations, and the emphasis to which they have led us on the development of the emotional life, must not distract us from the probability that the frontal areas have other functions, of which the utilization of dexterity may well be one, and may be of consequence in the development and in the relief of compulsive acts. Indeed, so far from being concerned merely with affect and overt behaviour, the frontal areas were until comparatively recent years conceived of by clinicians as being primarily association areas. Brickner (1935, 1936), after detailed study of the effects of bilateral frontal lobectomy, concluded: 'Only one function is considered as primarily affected. This is the elaborate association or synthesis into complex structures of the simpler engrammic products associated in the more posterior parts of the brain. There is a diminution in the amount of this synthesis, which places a limit upon the degree of attainable complexity of thought. ... The deduction has been drawn that the frontal lobes are not intellectual *centers* in any sense except, perhaps, a quantitative one, and that they play no specialized role in intellectual function. They add to intellectual intricacy in a quantitative manner only, by increasing the number of possible associations between engrammes which have already been aggregated to a complex degree in other parts of the nervous system.' Such a conclusion has much in common with what has already been noted in our patients after leucotomy. It is reminiscent also of the failure of Worchel and Lyerly's cases on free association tests (1941), of the post-operative impairment found

on word-association tests by Porteus and Kepner (1944), of Rylander's finding that the post-operative capacity for association was 'distinctly reduced' (1946), and of comparable conclusions by Petrie (1948). The importance of this lies in the fact that the more the frontal areas are known to be concerned with the elaboration of the emotional, the intellectual, and the behavioural life, the more readily can we explain the reductions in affect, and in contemplative and physical activity, which we have already observed in our patients after leucotomy.

This is of importance also in explaining the lack of restraint. Freeman and Watts (1942) have said: 'The pre-frontal regions long-circuit our actions, make for deliberation and delay, to the end that the decision shall be mature and the results measure up to expectation. They impose caution, restrain any action until we are as certain as is possible of the future implications of the action.' And the destruction of such long circuits presumably determines the post-operative lack of restraint and the failure to make deliberative judgments, while it may well account also for the rapidity with which irritability dies down and for the post-operative reduction in obsessional rumination.

If, therefore, we conceive of the frontal lobes (notwithstanding Hebb and Penfield's case (1940) of bilateral frontal lobectomy, in which Hebb (1945) was unable to demonstrate any deficits) as mediating thought invested with emotion, elaborating and intensifying that by associations, synthesizing its components, finding in that finished product some prompting to activity, perhaps counteracting that by some cross-current which further newly-awakened associations have set up, thus rejecting some component and substituting for it another, and so achieving a final result which prompts to activity again, and in so doing arouses new emotions, which awaken fresh associations still, and so on through the life history, it is not difficult to envisage that the post-operative reduction of pathways will prevent the continuation of such function to the same degree. So it would be that in a person of limited culture living in an environment of limited culture, the reduction of capacity might not be noticeable. But in a more highly-organized person undertaking complicated work in circumstances where elaborate behaviour was customary,

the reduction might be more striking, even though functionally the result might still be better.

With some such concepts as these in mind, it may be possible to explain something of the results of pre-frontal leucotomy. Even so, there are reservations. It is not felt that these explanations towards which we have been groping even begin to explain the intellectual deficits. No doubt, reduction of pathways with consequently reduced potentiality for synthesis may play some part. But that rings no more true as the whole explanation than do attempts to explain failure on sensorial tests on grounds of lack of effort and attentiveness. It might be tempting, but it is not convincing, to attribute the sensorial failure to a combination of these two factors. For patients who are markedly alert and attentive may do less well on tests than those who are not, when their pre- and post-operative performances are compared; patients who are quite alert may be those who fail to shift their attention; patients who try may show more post-operative reduction of performance than they who do not, and vice versa. And if one seeks to interpret failure to reproduce a simple story or to reverse digits, on the basis of a mere quantitative reduction of pathways, so enormous a reduction must surely be implied as would make itself felt far more obviously in other ways. For this it seems that some quite other concept is additionally required, such perhaps as that of Goldstein whose 'catastrophic reaction' (1936) seems to have something in common with Alford's view (1943) of the aphasias, apraxias, agnosias, and the so-called frontal lobe syndrome, as being merely the manifestations of upset of the dynamic equilibrium of a whole but unstable mentality. In fact, in some of our cases the intellectual changes seem permanent, and it cannot be felt that the mentality is 'whole' in the sense in which it was before, while the functioning seems to be more stable. Even so, it seems that the possibility of there being factors at work other than the mere affective and anatomical reduction—whether an instability of function as opposed to a static anatomical deficiency, or some change in the processes of thought such as Goldstein has put forward—must be taken into account, though we do not know the means by which they are mediated, and though they are not clinically detectable in all our cases.

There is another reservation in that nothing that Freeman and Watts have said, or that our own considerations have shown, has thrown light on those dramatic recoveries that may follow the operation, though so uncertainly, in schizophrenia. It is true that there may be improvement through reduction of the affective components of the illness, as we have seen in other conditions, so that with diminished excitement there comes increased accessibility and amenableness to reason. It seems also true of schizophrenic cases that the more that affective processes and psycho-dynamics play a part, the better is the post-operative outcome likely to be; but sometimes a startling emergence into normality may follow operation, seemingly against all reason and common sense. To try to understand the *modus operandi* of leucotomy in the affective disorders is difficult enough; to try to understand it in schizophrenia is bewildering. Yet a suggestive item emerges which may be worth considering.

We know that the most obviously important change after leucotomy is in the thalamus. The thalamus appears to be an integrating organ. The essence of schizophrenia, as its name implies, is disintegration. The thalamus, it seems likely, integrates perceptions, emotions, and patterns of behaviour. Schizophrenia is especially characterized by disorders of perception, disintegrated emotion, and disturbed behaviour. The thalamus, again, is intimately connected with the hypothalamus through which great autonomic influences are exerted. The autonomic disturbances in schizophrenia are numerous and striking. The effect of barbiturates, and notably sodium amytal, in rendering stuporose schizophrenics accessible is dramatic. Their primary site of action is thalamic. Schizophrenic cataleptic states resemble those producible by bulbo-capnine. The action of bulbo-capnine is on the basal ganglia. The sudden schizophrenic episodes of inaccessibility, with the so-called 'thought blocking' in which animation seems to be suspended, and the sudden inexplicable flights into impulsive behaviour, may quite conceivably be related to contrasting disorders of suppressor function of those areas discovered by Hines (1937) and by Dusser de Barenne and McCulloch (1941). The thalamus plays an indispensable part in suppressor function.

These points are very suggestive. When we consider that some schizophrenic cases are apparently cured, and others much

improved, by an operation which seems to exert its primary influence on the thalamus, they become more so. While it is difficult to think that the pathology of the schizophrenic illnesses is not widespread and diffuse, it would seem, none the less, that there may be some nodal point on which to focus our attention. If this is so we may be stimulated or dismayed, according to the temperament, by the implication of what lies before us in Alexander's (1942) finding that the architectural patterns of normal thalami show wide differences, and in his conclusion that 'human thalami are almost as different in appearance as human faces.'

It is clear that we have touched but the fringe of the subject, and that we have but the vaguest ideas both as to the nature of the illnesses which we seek to cure, and of the principles underlying this attempt to cure them. Apart from interference with thalamo-frontal pathways, as to the influence of which we have some sketchy guesswork, what other processes may not be involved, perhaps tending towards, but also perhaps militating against, post-operative improvement: such as the vaso-motor, haemostatic, metabolic, and inhibitory responses suggested by Cid, the neuroglial reactions put forward by Guiraud (1937), the oligodendroglial changes observed by Elvidge and Reed (1938), the benign physio-chemical changes that Alexander and Loewenbach (1944) have been led to postulate by their investigation of electroplexy, or the adverse physio-chemical reaction that Alford (1944) has arrestingly inferred to follow cerebral lesions as a whole? And by what interplay of what obscure antagonistic processes are we to account for such a sequence of events as occurred in CASE 229 (page 255), where slow post-operative improvement was followed by relapse, to be followed a year later by a return to near normality and work, after an illness that had lasted for 10 years prior to operation?

There is another reservation in that nothing that Freeman and Watts have said, or that our own considerations have shown, has thrown light on those dramatic recoveries that may follow the operation, though so uncertainly, in schizophrenia. It is true that there may be improvement through reduction of the affective components of the illness, as we have seen in other conditions, so that with diminished excitement there comes increased accessibility and amenableness to reason. It seems also true of schizophrenic cases that the more that affective processes and psycho-dynamics play a part, the better is the post-operative outcome likely to be; but sometimes a startling emergence into normality may follow operation, seemingly against all reason and common sense. To try to understand the *modus operandi* of leucotomy in the affective disorders is difficult enough; to try to understand it in schizophrenia is bewildering. Yet a suggestive item emerges which may be worth considering.

We know that the most obviously important change after leucotomy is in the thalamus. The thalamus appears to be an integrating organ. The essence of schizophrenia, as its name implies, is disintegration. The thalamus, it seems likely, integrates perceptions, emotions, and patterns of behaviour. Schizophrenia is especially characterized by disorders of perception, disintegrated emotion, and disturbed behaviour. The thalamus, again, is intimately connected with the hypothalamus through which great autonomic influences are exerted. The autonomic disturbances in schizophrenia are numerous and striking. The effect of barbiturates, and notably sodium amytal, in rendering stuporose schizophrenics accessible is dramatic. Their primary site of action is thalamic. Schizophrenic cataleptic states resemble those producible by bulbo-capnine. The action of bulbo-capnine is on the basal ganglia. The sudden schizophrenic episodes of inaccessibility, with the so-called 'thought blocking' in which animation seems to be suspended, and the sudden inexplicable flights into impulsive behaviour, may quite conceivably be related to contrasting disorders of suppressor function of those areas discovered by Hines (1937) and by Dusser de Barenne and McCulloch (1941). The thalamus plays an indispensable part in suppressor function.

These points are very suggestive. When we consider that some schizophrenic cases are apparently cured, and others much

Cook, L. C. (1946), *Proc. R. Soc. Med.*, 39, 449.
[illegible] *Ann. Med. Psychol.*, 95, 307.

Curran, R. D. (1948), Croonian Lectures.
Dax, E. C., and Radley-Smith, E. J. (1943), *J. Ment. Sci.*, 89, 182.
Eidem (1946), *Proc. R. Soc. Med.*, 39, 448.
Duff, D. G. (1946), *Lancet*, ii, 639.
Dusser de Barenne, J. G., and McCulloch, W. S. (1938), *J. Neurophysiol.*, 1, 69.
*Elvidge, A. R., and Reed, G. E. (1938), *Arch. Neurol. Psychiat.*, 40, 227.
Fleming, G. W. H. T., and McKissock, W. (1943), *Lancet*, i, 361.
Fleming, G. W. H. T. (1944), *J. Ment. Sci.*, 90, 486.
Foerster, O., and Gagel, O. (1933), *Ztschr. f.d. ges. Neurol. u. Psychiat.*, 149, 312.
Frank, J. (1946), *J. Ment. Sci.*, 92, 497.
*Freeman, W., and Watts, J. W. (1942), *Psychosurgery*, Springfield.
Eidem (1944), *J. Ment. Sci.*, 90, 532.
Eidem (1947), *J. Comp. Neurol.*, 86, 65.
Freeman, W. (1948), *Lancet*, ii, 371.
Fulton, J. F., and Bailey, P. (1929), *J. Nerv. Ment. Dis.*, 69, 1, 145, 261.
Goldstein, K. (1932), *Med. Klinik.*, 28, 1796.
Idem (1936), *J. Neurol.*, 17, 27.
Idem (1939), *After Effects of Brain Injuries in War*, London, Heinemann.
* Idem and Scheerer, M. (1941), *Psycholog. Monogr.*, 53, 2.
Guiraud, M. (1937), *Ann. Med. Psychol.*, 95, 308.
Guttmann, E., and Hermann, K. (1932), *Ztschr. f.d. ges. Neurol. u. Psychiat.*, 140, 439.
Hebb, D. O., and Penfield, W. (1940), *Arch. Neurol. Psychiat.*, 44, 421.
*Hebb, D. O. (1945), *Arch. Neurol. Psychiat.*, 54, 10.
Henderson, D.K., and Gillespie, R.D. (1945), *Textbook of Psychiatry*, O.U.P., 5th Edition.
Hines, M. (1937), *Johns Hopkins Hosp. Bull.*, 60, 313.
Hobson, J. A. (1936), quoted in Report on Shock Treatments to the Board of Control, H.M. Stationery Office, London.
Hoch, A. H., and MacCurdy, J. T. (1922), *Arch. Neurol. Psychiat.*, 54, 10.
*Hofstatter, L., Smolik, E. A., and Busch, A. K. (1944), *Arch. Neurol. Psychiat.*, 53, 125.
Eidem and Clancy, J. F. (1945), *Sth. Med. J.*, 38, 604.
Hutton, E. L. (1943), *Lancet*, i, 362.
Eadem (1947), *J. Ment. Sci.*, 93, 31.
Klemme, R. M. (1938), *Sth. Med. J.*, 31, 1095.
Idem (1941), *Amer. J. Ophthalmol.*, 24, 1000.
Knight, G. C. (1943), *J. Ment. Sci.*, 89, 174.
Kraepelin, E. (1904), *Lectures in Clinical Psychiatry*, London, Ballière, Tindall & Cox.

BIBLIOGRAPHY

THE references are grouped according to what is considered their most valuable trend. That is to say, the categories are not necessarily mutually exclusive. The asterisks indicate no more than that such articles deal with some aspect of special interest, or epitomize succinctly considerations that are of importance. Observations on historical cases that have achieved the post-leucotomy state, or something like it, from accidental causes are included under the heading of 'Operative Techniques'.

REVIEWS OF THE LITERATURE

BRODIE, E. B., and MOORE, B. E. (1946), *Connecticut M. J.*, 10, 409.
FLEMING, G. W. T. H. (1944), *J. Ment. Sci.*, 90, 486.
FREEMAN, W., and WATTS, J. W. (1942), *Psychosurgery*, Springfield.
FREEMAN, W. (1947), *Progress in Neurology and Psychiatry*, Ed. Spiegel, N.Y., Grune & Stratton.
Idem (1948), ibid.
Idem (1949), ibid.
GREENBLATT, M., and MYERSON, P. G. (1949), *New Eng. J. of Med.*, 240, 1006.
KOLB, L. C. (1949), *J. Nerv Ment. Dis.*, 110, 112.
WALKER, A. E. (1944), *Int Abstr. Surg.*, S G.O., 78, 1.

REFERENCES IN THE TEXT

ALEXANDER, L., and LOEWENBACH, H. (1944), *J. Neuropathol. Exp. Neurol*, 1, 444.
ALFORD, L. B. (1943), *Psychosomatic Medicine*, 5, 15.
Idem (1944), *J. Nerv. Ment. Dis*, 99, 172.
ALPERS, B. J. (1937), *Arch. Neurol. Psychiat.*, 38, 291.
BECK, E., MCLARDY, T., and MEYER, A. (1950), *J Ment. Sci.*, 96, 157.
BLEULER, E. (1923), *Textbook of Psychiatry*, MacMillan.
Board of Control (1947) Report on 1,000 Cases, H.M. Stationery Office, London.
BRICKNER, R. M. (1935), *Arch. Neurol. Psychiat.*, 31, 118.
Idem (1935), *Intellectual Functions of the Frontal Lobes*, N.Y., MacMillan.
Idem (1939), *Arch. Neurol. Psychiat.*, 41, 1166.
BUCY, P. ([illegible]
BUMKE, C [illegible] *Neurologie*, Berlin, Springer.
BURCKHARDT, G. (1890), *Allg. Ztschr f.Psychiat*, 47, 463.
*CID, S. (1937), *Ann. Med Psychol.*, 95, 308.
*COBB, S. (1943), *Borderlands of Psychiatry*, Harvard University Press. (Third printing 1945.)

WOODWORTH, R. S. (1935), *Arch. Neurol. Psychiat.*, 31, 119.
ZIEGLER, L. (1943), *Amer. J. Psychiat.*, 100, 178.
ZIEGLER, L. K., and OSGOOD, C. W. (1945), *Arch. Neurol. Psychiat.*, 53, 262.

CLINICAL OBSERVATIONS

*ARNOT, R. E. J. (1949), *J. Nerv. Ment. Dis.*, 109, 267.
BAGDASAR, D., and CONSTANTINESCO, J. (1937), *Bull. mem. Soc. Med. hop. Bucharest*, 19, 78.
BANAY, R. S., DAVIDOFF, L. (1942), *J. Crim. Psychopathology*, 41, 59 (see also Freidlander, J. W., and Banay, R. S.).
BENNETT, A. E., KEEGAN, J., and WILBUR, C. B. (1944), *J. Amer. Med. Ass.*, 123, 809.
*BERLINER, F., MAYER-GROSS, W., BERRIDGE, R. L., and MOORE, J. N. P. (1945), *Lancet*, ii, 325.
BLEULER, M. (1948), *Schweiz. med. Wchnschr.*, 78, 841.
BURLINGAME, C. C. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 31.
CAMERON, D. E., and PRADOS, M. (1948), *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 534.
CID, S. (1937), *Ann. Med. Psychol.*, 95, 308.
COHEN, L. M., NOVICK, R. G., ETTELSON, A. (1942), *Psychosomat. Med.*, 4, 96.
*COLUMBIA-GREYSTONE ASSOCIATES (1949), *Selective Partial Ablations of the Frontal Cortex*, N.Y., Hoeber.
COOK, L. C. (1945), *Proc. R. Soc. Med.*, 39, 449.
ELLIOTT, H., ALBERT, S., and BREMNER W. (1948), *Treatment Serv. Bull.*, 3, 26.
ENGLER, M. (1948), *J. Ment. Sci.*, 94, 844.
FALCONER, M. A. (1948), *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 706.
FLEMING, G. W. T. H. (1942), *J. Ment. Sci.*, 88, 282.
Idem (1944), *J. Ment. Sci.*, 90, 486.
Idem and MCKISSOCK, W. (1943), *Lancet*, i, 361.
*FRANK, J. (1946), *J. Ment. Sci.*, 92, 497.
Idem (1946), *Proc. R. Soc. Med.*, 39, 443.
FRANKL, L., and MAYER-GROSS, W. (1947), *Lancet*, ii, 820.
FREEMAN, W., and WATTS, J. W. (1937), *Sth. Med. J.*, 30, 27.
Eidem (1938), *Bull. Los Angeles Neurol. Soc.*, 3, 51.
Eidem (1938), *Neurol.*, 1, 345.
Eidem (1938), *J. Nerv. Ment. Dis.*, 88, 589.
Eidem (1939), *Yale J. Biol. and Med.*, 11, 527.
Eidem (1941), *J. Amer. Med. Ass.*, 117, 519.
Eidem (1941), *Psychosomat. Med.*, 3, 111.
Eidem (1942), *Dis. Nerv. Syst.*, 3, 111.
Eidem (1942), *Amer. J. Psychiat.*, 98, 532.
* Eidem (1942), *Psychosurgery*, Springfield.
Eidem (1943), *Sth. Med. J.*, 36, 478.
Eidem (1943), *Am. J. Psychiat.*, 99, 798.
Eidem (1944), *J. Ment. Sci.*, 90, 532.

LE BEAU, J. (1948), *Sem. Hop. Paris*, 60, 1937.
LEWIS, A. J. (1946), Price's *Textbook of Medicine*, O.U.P., 7th Edition.
LIEBERT, E. (1942), quoted in Freeman and Watts, *Psychosurgery*, q.v.
LYERLY, J. G. (1937), *J. Florida Med. Ass.*, 25, 225.
*MACKAY, G. W. (1948), *J. Ment. Sci.*, 94, 834.
MCKISSOCK, W. (1943), ibid., 89, 194.
Idem (1946), Personal communication.
Idem (1947), Personal communication.
Idem (1949), *Proc. R. Soc. Med*, 42 (Suppl.), 13.
MCLARDY, T. (1948), M.D. Thesis to the University of Glasgow.
Idem and MEYER, A. (1949), *J. Ment. Sci.*, 95, 182.
MCMENEMEY, W. H. (1947), Personal communication.
MEYER, ADOLF (1937), *Sth. Med. J.*, 30, 31.
Idem (1938), Memoranda to Phipps Clinic.
MEYER, ALFRED, and BECK, E. (1945), *J. Ment. Sci.*, 91, 411.
Eidem (1947a), Personal communication.
Eidem and MCLARDY, T. (1947), *Brain*, 70, 18.
MILLER, J. G. (1941), *Unconsciousness*, New York, John Wiley & Sons.
MIXTER, W. J., TILLOTSON, K. J, and WIES, D. (1940), *Arch. Neurol. Psychiat.*, 44, 236
Eidem (1941), *Psychosomat. Med.*, 3, 26.
MONIZ, E. (1936), *Tentatives operatoires dans le traitement de certaines psychoses*, Masson, Paris.
Idem and FURTADO, D. (1937), *Ann. Med. Psychol*, 95, 298.
MOORE, J. N P. (1946), *Proc. R. Soc. Med.*, 39, 453.
MUNCIE, W. (1939), *Psychobiology and Psychiatry*, St. Louis, C. V. Mosby.
PARTRIDGE, M A. (1949), *J. Ment Sci.*, 95, 795.
PENFIELD, W. (1948), *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 519.
PEYTON, W. T., NORAN, H., and MILLER, E. (1948), *Am. J. Psychiat.*, 104, 573 F.
POOL, J. L. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 1.
Idem (1949), *Bull. N.Y. Acad. Med.*, 25, 335.
REES, T. P. (1943), *J. Ment. Sci.*, 89, 161.
REITMAN, F. (1946), *Amer. J. Psychiat.*, 103, 238.
RYLANDER, G. (1939), *Personality Changes after Operations on the Frontal Lobes*, O.U.P.
SANDS, D. P. (1947), Paper read to Internat. Conf. Physicians, London.
SPIEGEL, E. A, and WYCIS, H P. (1949), *Proc. Roy. Soc. Med*, 42, 12 and 48.
*STRÖM-OLSEN, R. (1946), *Proc. R. Soc. Med.*, 39, 458.
* Idem and TOW, P. M. (1949), *Lancet*, 1, 87.
THORPE, F. T. (1946), *Brit. Med. J.*, i, 312.
TIBBETTS, R. W. (1949), *Brit. Med. J.*, ii, 1452.
WELT, L. (1887), *Deutsch. Arch. f. Klin. Med.*, 42, 339.
WILLWAY, F. (1943), *J. Ment. Sci.*, 89, 192.
WINNICOTT, D. (1943), *Lancet*, i, 475.
Idem (1947), *Brit. Med. J.*, 1, 688.

LOVE, J. A., PETERSEN, M. C., and MOERSCH, F. P. (1949), *Minn. Med.*, 32, 148.

LYERLY, J. G. (1939), *Southern Surgeon*, 8, 426.

Idem (1941), *J. Amer. Med. Ass.*, 117, 519.

Idem (1943), *Sth. Med. J.*, 36, 484.

*MASON, T. H., and HAMBY, W. B. (1948), *J. Amer. Med. Ass.*, 136, 1039.

MAYER, E. E. (1948), *J. Crim. Law and Criminol.*, 38, 576.

MCKENZIE, K. G., and PROCTOR, L. D. (1946), *Canada M. A. J.*, 55, 433.

MEDLICOTT, R. W. (1943), *N.Z. Med. J.*, 42, 113.

MIXTER, W. J., TILLOTSON, K. J., and WIES, D. D. (1940), *Arch. Neurol. Psychiat.*, 44, 236.

[illegible]

[illegible] 85.

MONIZ, E., and FURTADO, D. (1937), *Ann. Med. Psychol.*, 95, 298.

*MOORE, B. E., FRIEDMAN, S., SIMON, B., and FARMER, J. (1948), in 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 769.

MOORE, J. N. P. (1946), *Proc. R. Soc. Med.*, 39, 453.

PARKER, C. S. (1946), *J. Ment. Sci.*, 92, 719.

PARTRIDGE, M. A. (1948), *Lancet*, ii, 257.

Idem (1949), *Practitioner*, 162, 224.

Idem (1949), *J. Ment. Sci.*, 95, 795.

[illegible] 426.

[illegible]

Idem (1948), *Dig. Neurol. Psychiat.*, 16, 403.

REES, T. P. (1943), *J. Ment. Sci.*, 89, 161.

REITMAN, F. (1948), *Amer. J. Psychiat.*, 105, 86.

*RITCHIE RUSSELL, W. (1948), *Lancet*, i, 356.

RIZZATTI, E., and BORGARELLO, G (1938), *Schizopfrenie*, 7, 241.

*ROSE, A. S., and SOLOMON, H. C. (1948), in Hoch's *Failures of Psychiatric Treatment*, N.Y., Grune & Stratton.

ROSIE, J. M. (1949), *J. Ment. Sci.*, 95, 431.

SARGANT, W. W , and STEWART, C. M. (1947), *Brit. Med. J.*, ii, 866.

SARGANT, W. W. (1946), *Proc. R. Soc. Med* , 39, 458.

SCARFF, J. E. (1946), *J. Neurosurg* , 5, 288.

SCHWARZ, E. (1945), *J. Ment. Sci.*, 91, 503.

SHORVON, H J. (1947), *Lancet*, ii, 714.

SNOW, H. B. (1949), *Psychiat. Quart.*, 23, 26.

STENGEL, E (1948), *Lancet*, ii, 257.

* Idem (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 41.

STEVENS, H (1948), *Quart. Rev. Neurol. Psychiat.*, 2, 106.

STRAUSS, E. B. (1949), *Proc. R. Soc. Med* , 42 (Suppl.), 53

*STRECKER, E. A , PALMER, H. D., and GRANT, F. C. (1941), *Amer. J. Psychiat.*, 98, 524.

*STRÖM-OLSEN, R. (1946), *Proc. R. Soc. Med* , 39, 451.

Idem, LAST, S. L., and BRODY, M. B. (1943), *J. Ment. Sci.*, 89, 165.

FREEMAN, W., and WATTS, J. W. (1944), *J. Neurosurg.*, **1**, 291.
Eidem (1944), *Inst. of Living*, **12**, 495.
Eidem (1945), *Am. J. Psychiat.*, **101**, 739.
Eidem (1946), *Proc. R. Soc. Med.*, **39**, 445.
Eidem (1946), *Lancet*, i, 953.
Eidem (1946), *J. Internat. Coll. Surg.*, **9**, 679.
Eidem (1946), *Am. J. Med. Sci.*, **211**, 1.
Eidem (1946), *Sth. Med. and Surg*, **108**, 246.
Eidem (1947) Arch. Neurol and Psychiat. **58**, 47.
Eidem (1947), *Dig. Neurol. Psychiat.*, **15**, 202.
Eidem (1948), In 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, **27**, 715.
Eidem (1948), *Am. J. Surg.*, **75**, 227.
Eidem (1948), *J. Int. Coll. Surg.*, **11**, 343.
FREEMAN, W. (1948), *Lancet*, ii, 371.
Idem (1948), *Sth. Med J.*, **41**, 1045.
Idem (1949), *Dtsch. Med. Woch*, **74**, 785.
Idem (1949), *Am. J. Psychiat.*, **105**, 581.
Idem (1949), *Post-Grad Med.*, **5**, 375
Idem (1949), *Proc. R Soc. Med.*, **42** (Suppl.), 28.
FRIEDLANDER, J. W, and BANAY, R. S. (1948), *Arch. Neurol. Psychiat*, **59**, 302.
FURTADO, D., RODRIGUES, M., MARQUES, V., ALVIN, F., DE VASCONCELOS, A. (1949), *Mschr. f Psych. and Neurol.*, **117**, 65.
GOLLA, F. L. (1943), *J. Ment. Sci.*, **89**, 189
* Idem (1946), *Proc. R. Soc. Med.*, **39**, 443.
GARMANY, G (1948), *J. Ment. Sci.*, **94**, 428.
GOVINDASWAMY, E., and BALAKRISHNA RAO, B. N. (1944), *Lancet*, i, 466.
GREENBLATT, M, ARNOT, R. E, POPPEN, J. L., and CHAPMAN, W. P. (1948). *Am. J Psychiat*, **104**, 361.
HALL, B. H., and BERNSTEIN, L L. (1948), *J. Kansas Med. Soc.*, **49**, 333.
HEILBRUNN, G, HLETKO, P. (1943), *Amer. J. Psychiat.*, **99**, 569.
HENDERSON, SIR D. (1948), *J. Ment. Sci.*, **94**, 18
HOCH, P. H. (1949), *Proc. R Soc. Med.*, **42** (Suppl.), 23.
HUTTON, E L., FLEMING, G. W. T. H, and FOX, F. E. (1949), *Lancet*, ii, 3.
HUTTON, E. L. (1942), *J. Ment. Sci*, **88**, 275.
Eadem (1943), *Lancet*, i, 362.
Eadem (1947), *J Ment. Sci*, **93**, 31.
Eadem (1947), ibid., **93**, 333
JONES, G. N., and MCCOWAN, P. K. (1949), *J Ment. Sci.*, **95**, 101.
KALINOWSKY, L. B., and SCARFF, J. E. (1948), *Amer. J. Psychiat*, **105**, 81.
KALINOWSKY, L. B. (1949), *Proc. R Soc. Med*, **42** (Suppl.), 43.
KINDWALL, J. A., and CLEVELAND, D. (1945), *Amer. J. Psychiat.*, **101**, 749.
KLEIN, M. R., and TARDIEU, G. (1949), *Sem Hop. Par.*, **25**, 113.
KRAPF, E. E. (1947), *Rev. Neurol. de Buenos Aires*, **12**, 267.
LAWRENCE, B G. (1938), *Delaware M. J.*, **10**, 81
LIPSON, H., CRAWFIS, E. W., SHANNON, E. W, KARNOSH, J. (1947), *Post-Grad. Med.*, **1**, 214

LOVE, J. A., PETERSEN, M. C., and MOERSCH, F. P. (1949). *Minn. Med.*, 32, 148.
LYERLY, J. G. (1939). *Southern Surgeon*, 8, 426.
Idem (1941). *J. Amer. Med. Ass.*, 117, 519.
Idem (1943). *Sth. Med. J.*, 36, 484.
*MASON, T. H., and HAMBY, W. B. (1948). *J. Amer. Med. Ass.*, 136, 1039.
MAYER, E. E. (1948). *J. Crim. Law and Criminol.*, 38, 576.
MCKENZIE, K. G., and PROCTOR, L. D. (1946). *Canada M. A. J.*, 55, 433.
MEDLICOTT, R. W. (1943), *N.Z. Med. J.*, 42, 113.
MIXTER, W. J., TILLOTSON, K. J., and WIES, D. D. (1940). *Arch. Neurol. Psychiat.*, 44, 236.
Eidem (1941), *Psychosomat. Med.*, 3, 26.
MONIZ, E. (1936), *Bull. Acad. de Med. Paris*, 115, 385.
Idem and LIMA, A. (1936), *Rev. Neurol.*, 65, 582.
MONIZ, E., and FURTADO, D. (1937), *Ann. Med. Psychol.*, 95, 298.
*MOORE, B. E., FRIEDMAN, S., SIMON, B., and FARMER, J. (1948), in 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 769.
MOORE, J. N. P. (1946), *Proc. R. Soc. Med.*, 39, 453.
PARKER, C. S. (1946), *J. Ment. Sci.*, 92, 719.
PARTRIDGE, M. A. (1948), *Lancet*, ii, 257.
Idem (1949), *Practitioner*, 162, 224.
Idem (1949), *J. Ment. Sci.*, 95, 795.
PETERSEN, M. C., and BUCHSTEIN, H. F. (1942), *Amer. J. Psychiat.*, 99, 426.
Eidem (1943), *Proc. Staff. Meetings, Mayo Clinic*, 18, 368.
POPPEN, J. L. (1946), *Lahey Clin. Bull.*, 4, 205.
Idem (1948), *Dig. Neurol. Psychiat.*, 16, 403.
REES, T. P. (1943), *J. Ment. Sci.*, 89, 161.
REITMAN, F. (1948), *Amer. J. Psychiat.*, 105, 86.
*RITCHIE RUSSELL, W. (1948), *Lancet*, i, 356.
RIZZATTI, E., and BORGARELLO, G. (1938), *Schizopfrenie*, 7, 241.
*ROSE, A. S., and SOLOMON, H. C. (1948), in Hoch's *Failures of Psychiatric Treatment*, N.Y., Grune & Stratton.
ROSIE, J M. (1949), *J. Ment. Sci.*, 95, 431.
SARGANT, W. W., and STEWART, C. M. (1947), *Brit. Med. J.*, ii, 866
SARGANT, W. W. (1946), *Proc. R. Soc. Med.*, 39, 458.
SCARFF, J. E. (1946), *J. Neurosurg.*, 5, 288.
SCHWARZ, E. (1945), *J. Ment. Sci.*, 91, 503.
SHORVON, H. J. (1947), *Lancet*, ii, 714.
SNOW, H. B. (1949), *Psychiat. Quart.*, 23, 26.
STENGEL, E (1948), *Lancet*, ii, 257.
* Idem (1949), *Proc R. Soc. Med.*, 42 (Suppl.), 41.
STEVENS, H (1948), *Quart. Rev. Neurol. Psychiat.*, 2, 106.
STRAUSS, E B. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 53.
*STRECKER, E. A., PALMER, H. D., and GRANT, F. C. (1941), *Amer. J. Psychiat.*, 98, 524.
*STRÖM-OLSEN, R. (1946), *Proc. R. Soc. Med*, 39, 451.
Idem, LAST, S. L., and BRODY, M. B. (1943), *J. Ment. Sci.*, 89, 165.

*STRÖM-OLSEN, R., and TOW, P. M. (1949), *Lancet*, i, 87.
TARUMIANZ, M. A. (1941), *J. Amer. Med. Ass.*, 117, 520.
THORPE, F. T. (1946), *Brit. Med J.*, i, 312.
WORTHING, H., BRILL, H., and WIGDERSON, H. (1949), *Psychiat. Quart*, 23, 617.
WYNEGAR, D. E. (1942), *Delaware State M. J.*, 14, 96.
YAHN, M. (1946), *Arq. de Neuropsiquiat. San Paulo*, 4, 213.
ZUCHA, J. (1946), *Bratislav. Lekarske Listy.*, 26, 1.

OPERATIVE TECHNIQUES

ALI, V. (1941), *Neopsichiat.*, 7, 1.
BARRETTO, A. C. (1945), *Brazil Arq. Neuropsiquiat.*, 3, 420.
BONSEMBIANTE, L. E., and BABBINI, R. J. (1945), *Rev. Argent. de Neurol. and Psiquiat.*, 10.
*COLUMBIA-GREYSTONE ASSOCIATES (1949), *Selective Partial Ablations of the Frontal Cortex*, N.Y., Hoeber.
DAX, E. C., and RADLEY-SMITH, E. J. (1943), *J. Ment. Sci.*, 89, 182.
Eidem (1946), *Proc. R. Soc. Med.*, 39, 448.
DE NOBELE, E. (1835), *Ann. de Med. Belge*, 1, 115.
DRAKE, R. L., and HIBBARD, J. S. (1942), *J. Kansas Med. Soc.*, 43, 345
DUFF, D. G. (1946), *Lancet*, ii, 639.
*EGAN, G. (1949), *J. Ment. Sci.*, 95, 115.
FIAMBERTI, A. M. (1937), *Rass. Studi. Psichiat.*, 26, 797.
FLEMING, G. W. T. H., and PHILLIPS, D. G. (1949), *J. Ment. Sci.*, 95, 197.
FREEMAN, W., and WATTS, J. W. (1942), *Psychosurgery*, Springfield.
*FREEMAN, W. (1948), *Lancet*, ii, 371.
Idem (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 8.
HALL, F. W., and WILLIAMS, D. B. (1948), *S. Dakota J. Med. and Pharm.*, 1, 191.
[illegible]
[illegible]
*HEATH, R. G., and POOL, J. L. (1948), *J. Nerv. Ment. Dis.*, 107, 411.
Eidem (1948), *Psychosomat. Med.*, 10, 254.
*HOFSTATTER, L., SMOLIK, E. A., and BUSCH, A. K. (1945), *Arch. Neurol. Psychiat.*, 53, 125.
Eidem (1948), *Post-Grad. Med.*, 3, 179.
JACKSON, H. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 15.
JONES, C. H., and SHANKLIN, J. G. (1948), *Northwest Med.*, 47, 421.
KNIGHT, G. C. (1943), *J. Ment. Sci*, 89, 174.
Idem (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 18.
*LE BEAU, J. (1948), *Sem Hop. Paris*, 60, 1937.
Idem *et al.* (1948), *Rev. Neurol*, 80, 481.
LEBENSOHN, Z. M. (1941), *Amer. J. Psychiat.*, 98, 56.
LINDSAY, W. F. (1904), *J. Amer. Med Ass.*, 42, 221.
LYERLY, J. G. (1938), *J. Florida Med. Ass.*, 25, 225.

McGregor, J. S., and Crumbie, J. R. (1941), *Lancet*, ii, 7.
Eidem (1942), *J. Ment. Sci.*, 88, 534.
McKissock, W. (1943), *J. Ment. Sci.*, 89, 194.
Idem (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 13.
Mendenhall, S. C. (1869), *Amer. J. Med. Sci.*, 103, 371.
Moniz, E. (1937), *Amer. J. Psychiat.*, 93, 1379.
Obrador, S. (1947), *J. Neuro-pathol. Exper. Neurol.* 6, 185.
Ody, F. (1938), *Arch. Ital. de Chir.*, 53, 321.
*Penfield, W. (1948), in 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 519.
Petersen, M. C., and Love, J. G. (1949), *Amer. J. Psychiat.*, 106, 65.
*Peyton, W. T., Noran, H., and Miller, E. (1948), *Amer. J. Psychiat.*, 104, 573 F.
Peyton, W. T., Haavik, J. E., Schiele, B. C. (1949), *Arch. Neurol. Psychiat.*, 62, 560.
Pool, J. L. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 1.
Idem (1949), *Bull. Acad. Med. N.Y.*, 25, 335.
Poppen, J. L. (1948), *Dig. Neurol. Psychiat.*, 16, 403.
Radley-Smith, E. J. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 15.
Reitman, F. (1946), *Amer. J. Psychiat.*, 103, 238.
Scarff, J. E. (1948), *J. Neurosurg.*, 5, 288.
*Scoville, W. B. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 3.
Idem (1949), *J. Neurosurg.*, 6, 65.
Spiegel, E. A., Wycis, H. P., Marks, M., and Lee, A. J. (1947), *Science*, 106, 349.
*Spiegel, E. A., and Wycis, H. P. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 12 and 84.
Eidem (1949), *Dig. Neurol. Psychiat.*, 17, 435.
van Wagenen, W. P. (1946), *Surgery*, 20, 656.
Yahn, M., Mattos Pimenta, A., and Sette, A. (1948), *Arq. Neuropsiquiat. San Paulo*, 6, 225.
Eidem (1948), *Dig. Neurol. Psychiat.*, 16, 618.

ANATOMICAL, PHYSIOLOGICAL, AND PATHOLOGICAL OBSERVATIONS

Alexander, L. (1942), *Proc. A. Res. Nerv. Ment. Dis.*, 21, 334.
*Beck, E., McLardy, T., and Meyer, A. (1950), *J. Ment. Sci.*, 96, 157.
Chapman, W. P., Rose, A. S., and Solomon, K. C. (1948), *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 754.
Chapman, W. P., Livingston, R. B., Livingston K. E. (1949), *Arch. Neurol. Psychiat.*, 62, 701.
*Clark, W. E. Le Gros (1948), *Lancet*, i, 353.
Cohn, R. (1945), *Arch. Neurol. Psychiat.*, 53, 283.

*COLUMBIA-GREYSTONE ASSOCIATES (1949), *Selective Partial Ablations of the Frontal Cortex*, N.Y., Hoeber.
DAVIES, P. A. (1941), *Psycho-somat. Med*, 3, 38
DONOVAN, J. F., GALBRAITH, A. J., and JACKSON, H. (1949), *J. Ment. Sci.*, 95, 655.
FREED, H., SPIEGEL, E., and WYCIS, H. (1949), *Psychiat. Quart.*, 23, 227.
FREEMAN, W., and WATTS, J. W. (1942), *Psychosurgery*, Springfield.
Eidem (1947), *J. Comp. Neurol.*, 86, 65.
FREUDENBERG, R. K., and ROBERTSON, J. P. S. (1949), *J. Ment. Sci.*, 95, 825.
GREVILLE, G. D., and LAST, S. L. (1947), *Proc. R. Soc. Med.*, 40, 145.
GREY WALTER, W. (1941), *Lancet*, ii, 6.
HEMPHILL, R. E. (1944), *Lancet*, ii, 345.
Idem, MCLEOD, L. D., and REISS, M. (1942), *J. Ment. Sci.*, 88, 554.
LEVINE, S., GREENBLATT, M., HEALEY, M., and SOLOMON, H. (1949), *Amer. J. Psychiat.*, 106, 174.
MALMO, R. B., SHAGASS, C. (1950), *Arch. Neur. Psychiat.*, 63, 113.
MANN, E G., BETTCHER, P. C., *et al.* (1947), *Yale J. Biol. and Med.*, 20, 175.
MCLARDY, T. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 19.
MCLARDY, T., and DAVIES, D. L. (1949), *J. Neurol. Neuro-surg. Psychiat.*, 12, 231.
*MCLARDY, T., and MEYER, A. (1949), *J. Ment. Sci*, 95, 182.
MEYER, A., and BECK, E. (1945), *J. Ment. Sci*, 91, 411.
Eidem and MCLARDY, T. (1947), *Brain*, 70, 18.
MEYER, A , and MCLARDY, T. (1947), *Proc. R. Soc. Med.*, 40, 141.
Eidem (1948), *J. Ment. Sci.*, 94, 555.
Eidem (1949), ibid., 95, 403.
Eidem and BECK, E. (1948), *Folia Psychiat. Neur. Neurochir. Neerl. Congressnummer*.
MEYER, M. (1949), *Brain*, 72, 265.
REED, J. (1948), *J Gastroenterol.*, 10, 118.
REITMAN, F. (1945), *J. Ment. Sci.*, 91, 318.
Idem (1946), *Brit. Med. J.*, 1, 235.
Idem (1947), *Proc R. Soc. Med.*, 40, 147
RINKEL, M , GREENBLATT, M., COON, G. P., and SOLOMON, H. C. (1947), *Arch. Neurol. Psychiat*, 58, 570.
Eidem (1947), *Amer. J. Psychiat.*, 104, 81.
SHENKIN, H., WOODFORD, R. B., FREYHAN, F. A , and KELLY, S. (1948), *Res Publ. Ass. Nerv. Ment. Dis.*, 27, 823
SPIEGEL, E. A., and WYCIS, H. P. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 84.
STEVENS, H , and MOSOVICH, A. (1947), *Am J. Psychiat*, 104, 73.
STJERNBERG, S. (1948), *Acta Neurol. Psychiat.*, 47 (Suppl.), 400.
SWEET, W. H., COTZIAS, G., SEED, J., and YAKOVLEV, P. (1948), *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 795
VAN DER HORST, L (1948), *Ned. Tschr genaestl.*, 92, 59.
ZIEGLER, L. H and OSGOOD, C. W. (1945), *Arch. Neurol. Psychiat*, 53, 262.
Eidem (1945), ibid, 53, 395.

OBSERVATIONS FROM PSYCHOLOGICAL TESTS

Andersen, A. L. (1949), *J. Consult. Psychol.*, 13, 105.
*Ashby, W. R., and Bassett, M. (1948), *J. Ment. Sci.*, 95, 418.
Babcock, H. (1947), *J. Abn. Soc. Psych.*, 42, 466.
Brody, M. B. (1944), *J. Ment. Sci.*, 90, 127.
Idem (1947), *Proc. Roy. Soc. Med.*, 40, 149.
*Columbia-Greystone Associates (1949), *Selective Partial Ablations of the Frontal Cortex*, N.Y., Hoeber.
Halstead, W. C. (1947), *Brain and Intelligence*, University of Chicago Press.
Idem, Carmichael, H. T., and Bucy, P. C. (1946), *Amer. J. Psychiat.*, 103, 217.
Hunt, T. (1940), *Psychol. Bull.*, 37, 546.
Idem (1942), *Psychosurgery*, ch. XIV, Springfield.
Hutton, E. L., and Bassett, M. (1948), *J. Ment. Sci.*, 94, 332.
Jones, R. E. (1949), *J. Abn. Soc. Psychol.*, 44, 315.
Kisker, G. W. (1943), *Amer. J. Psychiat.*, 100, 180.
Idem (1943), *Ohio State Med. J.*, 39, 913.
Idem (1943), *Arch. Neurol. Psychiat.*, 50, 691.
Idem (1944), *J. Nerv. Ment. Dis.*, 99, 1.
Idem
Idem
Koskoff, Y. D, ... T. (1948), in 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 723.
Malmo, R. B. (1942), *J. Neuro-physiol.*, 5, 295.
Idem (1948), in 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 537.
Peters, H. N. (1947), *J. Abn. Soc. Psychol.*, 42, 383.
*Petrie, A. (1949), *Brit. J. Med. Psychol.*, 22, Parts 3 and 4.
Idem (1949), *J. Ment. Sci.*, 95, 449.
Idem (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), 39.
Porteus, S. D., and Kepner, R. (1944), *Genet. Psychol. Monogr.*, 29, 9.
Porteus, S. D., and Peters, K. N. (1947), *Genet. Psychol. Monogr.*, 29, 3.
Reitman, F. (1947), *J. Ment Sci.*, 93, 55.
*Robinson, M. F. (1946), *J. Abnorm. Soc. Psychol.*, 41, 421.
* Idem (1949), *Dig. Neurol. Psychiat*, 17, 558.
Rylander, G., and Sjöqvist, O (1946), *Nordisk. Med.*, 29, 557.
Eidem (1948), in 'The Frontal Lobes,' *Res. Publ. Ass. Nerv. Ment. Dis.*, 27, 891.
Tow, P. M. (1949), *Proc. R. Soc. Med.*, 42 (Suppl.), ...
Ment. Dis., 27, 642.

INDEX